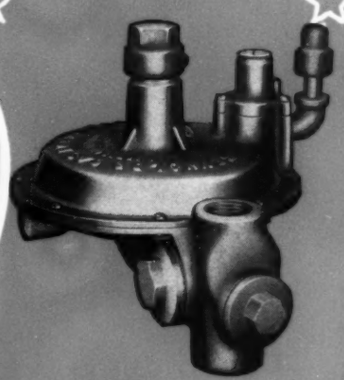
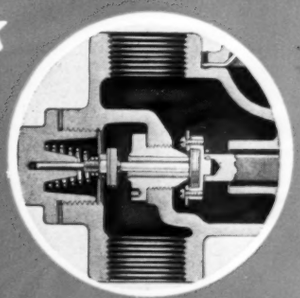
GAS

ENGINEERING • UTILIZATION • LOAD-BUILDING • MANAGEMENT

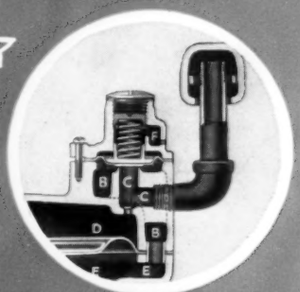
IT'S NEW!

★IT'S PROVEN AND PRACTICAL ★IT'S SAFE AND EFFICIENT





The automatic cut-off prevents the passage of gas through the regulator in case of failure of inlet pressure. It eliminates danger from inlet pressure failures as Regulator must be manually reset.



The Diaphragm operated relief valve prevents pressure building up on outlet side. It is extremely sensitive by reason of being Diaphragm operated.

Reynolds New Model 30, No. 1 Regulator, is setting unequalled records in actual performance. New valve design insures high capacity and straight line performance with variable inlet pressure. The long Removable Spring Type construction gives same sensitive regulation as dead weight type. Write for complete information about this new Reynolds Regulator with automatic gas cut-off and diaphragm operated relief valve. It's New! It's Proven! It's Efficient!

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REYNOLDS GAS REGULATOR COMPANY
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Recognized Gas Control Since 1892

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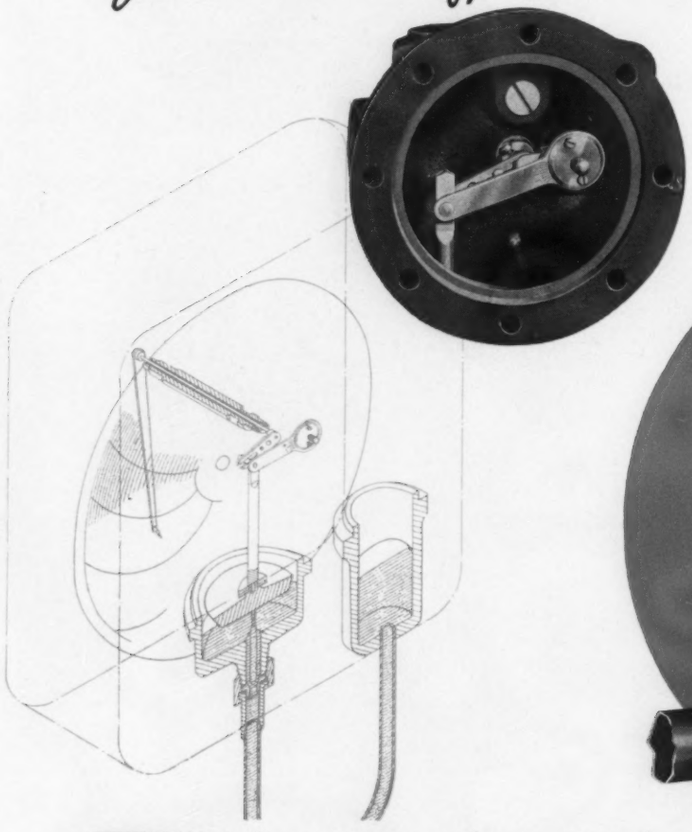
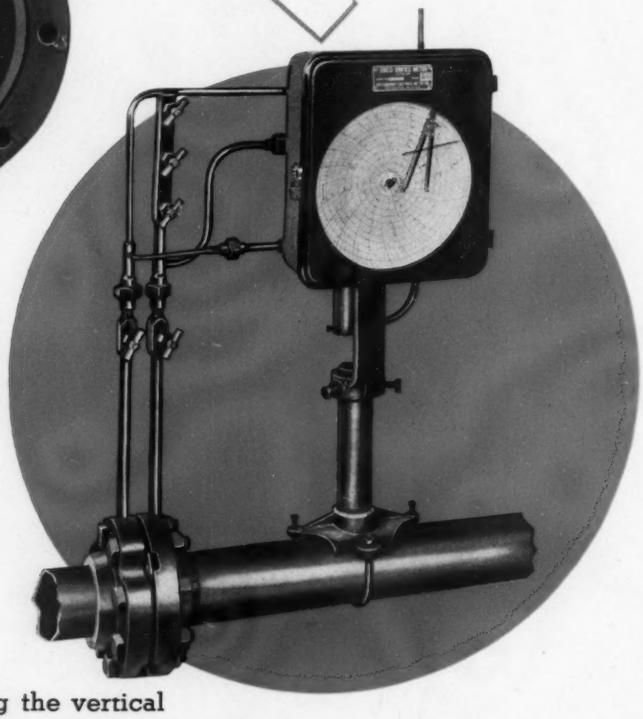
A DIFFICULT PROBLEM SIMPLY SOLVED

in the differential movement of the EMCO *type 38* ORIFICE METER





THE simple requirement of converting the vertical float displacement caused by flow differential to an accurate, equiangular pen motion on the chart has engaged the mechanical ingenuity of measurement engineers for decades. The two bar linkage solution, which has been so successfully used in the EMCO Type 38 Orifice Meter, illustrates the principle that difficult problems usually develop simple solutions.

Not only does this two bar linkage provide exact equiangular displacement of the pen for equal vertical movements of the float, but it does so in a positive friction free manner. The adjustment for differential has been worked into this assembly so that positive recording of differential pressure can be assured.

Bulletin 1050 completely describes the EMCO Type 38 Orifice Meter. Write for your copy today.

PITTSBURGH EQUITABLE METER COMPANY

MERCO NORDSTROM VALVE CO.

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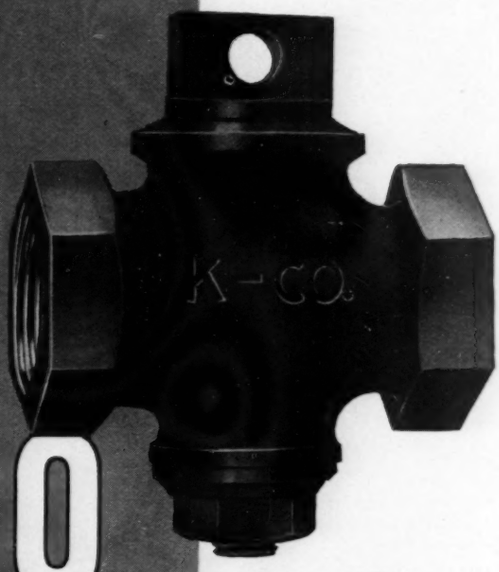
THE FOREMOST GAS STOP IN THE INDUSTRY

A KITSON gas stop is truly a precision built product . . . available in any style or size to meet the local requirements of every gas company. While ruggedly built for maximum service requirements, a KITSON gas stop is accurate and dependable.



G-201 Flathead Standard Gas Stop in Sizes ¼" to 2".

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GAS STOPS
EMERGENCY GAS SHUT-OFF VALVES
(for circulating water heaters)

METER BARS
TEMPERATURE AND PRESSURE RELIEF VALVES

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H. R. Basford Co. 60
The Blackstone Hotel 64
Blaw-Knox Co. ..
Bundy Tubing Co. 61
Butane-Propane News 58

Carbide and Carbon Chemicals Corp. ..
Cast Iron Pipe Research Association Third Cover
The Chaplin-Fulton Manufacturing Co. 54
Chicago Vitreous Enamel Products Co. ..
Clark Hotel 62
The Cleveland Trencher Co. 9
Condensation Engineering Corp. 60
Connelly Iron Sponge & Governor Co. ..
The Cooper-Bessemer Corp. ..
Crane Co. ..
Cribben & Sexton Co. 10

Detroit-Michigan Stove Co. ..
Dresser Manufacturing Co. 6

Fisher Governor Co. ..
Fraser Furnace Co. 60

Gasair Corp. 62
General Controls 5
General Gas Light Co. ..
James Graham Manufacturing Co. 47
Greenlee Tool Co. 57

Handbook Butane-Propane Gases, Revised Second Edition 54
Howle Co. ..

Johns-Manville ..
Johnson Gas Appliance Co. ..

Kitson Co. 1

P. M. Lattner Manufacturing Co. 59

Merco Nordstrom Valve Co. ..
Milwaukee Gas Specialty Co. 56
Minneapolis-Honeywell Regulator Co. ..
Mueller Co. 55
L. J. Mueller Furnace Co. 48

The National Supply Co. ..
National Tube Co. 3

Pacific Gas & Electric Co. 53
Pacific Gas Radiator Co. 55
Pacific Meter Works 12
Payne Furnace & Supply Co. 56
Philgas Dept., Phillips Petroleum Co. 59
Pittsburg Water Heater Corp. ..
Pittsburgh Equitable Meter Co. Second Cover

Reliance Regulator Corp. 8
Republic Heaters Sales Co. 63
Republic Steel Corp. 7
Reynolds Gas Regulator Co. Front Cover
M. H. Rhodes, Inc. 49
Robertshaw Thermostat Co. ..
Geo. D. Roper Corp. 44, 45

Semet-Solvay Engineering Corp. 48
Servel, Inc., Electrolux Sales Division 38, 39
Sharples Solvents Corp. ..
M. B. Skinner Co. 4
Spencer Thermostat Co. 50
The Sprague Meter Co. Fourth Cover
Standard Oil Company of California ..

U. S. Pipe & Foundry Co. ..
United States Steel 3

The Vent-A-Hood Co. 52

Ward Heater Co., Ltd. ..
Webster Engineering Co. 50
Welsbach Co. 63
Worthington Pump & Machinery Corp. ..

John Zink Burner Co. 51

GAS

Sixteenth Year of Publication

Contents for February, 1940

GUEST EDITORIAL: A Major Opportunity . . *By Frank C. Smith* 11

Thermally Thinking 13

The Industry Extends Its Service . . . . *By Walter C. Beckjord* 15

The Gas Mart . . . . . *By G. F. B. Owens* 17

The Formation of Scale and Methods of Its Prevention in Water Heaters . . . . . *By J. M. Krappe* 19

The Gas Range Outlook for 1940 . . . . . *By W. E. Derwent* 23

Gas Service South of the Border . . . . . *By Jay Jenkins* 24

United Gas Pipe Line Company's Sligo-Bistineau-Minden Project *By R. H. Feild and J. D. Ross* 27

GAS Camera 28

Locating Pipe Line Leaks With Odorant . . . . . *By L. Millis* 30

Indirect-Fired Baked Enamel Oven . . . *By Hugh R. Lamberth* 34

Calibration of Positive Meters . . . . . *By H. J. Sterk* 35

Health Promotion That Pays Dividends . . . . *By G. W. Cannon* 37

Traveling Showrooms Boost Sales . . . . . *By O. D. Hall* 42

Sales Slants 46

Industry Personalities 48

Current Reading 56

Modern Products 60

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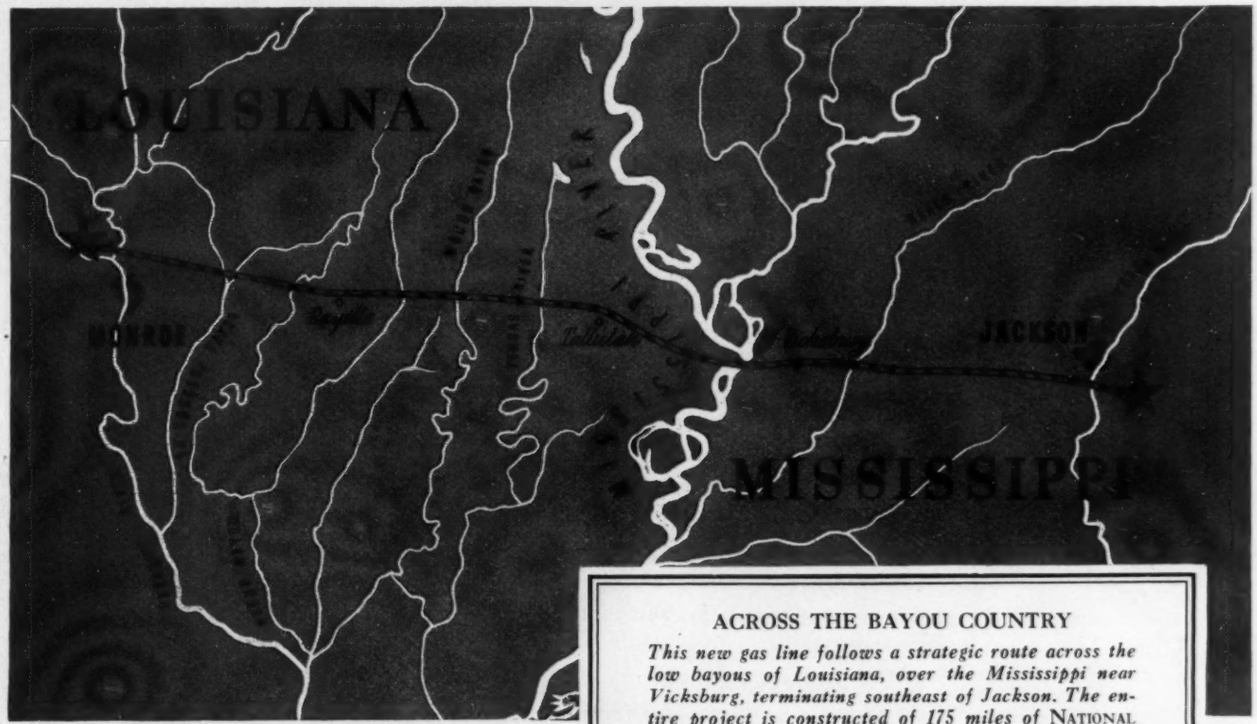
175 More Miles

OF "WALLS WITHOUT WELDS"



ACROSS THE BAYOU COUNTRY

This new gas line follows a strategic route across the low bayous of Louisiana, over the Mississippi near Vicksburg, terminating southeast of Jackson. The entire project is constructed of 175 miles of NATIONAL *Seamless Pipe, sizes as follows: Main line, 18" O.D.; Gathering lines, 4" to 20" O.D.; Highway and railroad crossings, 22" O.D. casing; River crossings, 10¾", 12¾" and 14" O.D. In all, this important gas line includes twelve major river crossings.*

New Trunk Line for United Gas Pipe Line Company... ALL NATIONAL SEAMLESS

FROM the rich gas fields of northern Louisiana to the markets of southern Mississippi, Alabama, Florida, and Louisiana, gas is now flowing through America's newest major pipe line. It is one of the few large-diameter lines to cross the Mississippi River south of St. Louis, and its successful completion proves that even the formidable "Father of Waters" is no bar to gas transmission via pipe line.

The selection of NATIONAL Seamless Pipe for this entire project, including the 123-mile 18-in. O.D. main truck line from the vicinity of Monroe, La., to a point near Jackson, Miss., as well as gathering lines and casings, is a good indication of the standing of NATIONAL Seamless with pipe line engineers, and industrial men in general. You'll find this pipe used in important lines everywhere.

Here are reasons why NATIONAL *Seamless stands so high:*

First of all, it's good pipe. NATIONAL *Seamless is pierced from solid billets of highest quality steel. It has no welded seam—no line of potential weakness. This pipe gives you uniformly high wall strength—a factor of vital importance in pipe lines designed for high-speed, high-pressure transmission of gas, oil, or gasoline.*

Second, National Tube Company is headquarters for good service. As the world's leading producer of steel pipe and tubes, National can meet your requirements speedily, efficiently, exactly as you desire. No order is too large or too small to receive the same efficient handling. National's engineers have worked with prominent contractors on so many projects under all conceivable conditions, that they are able to help in many ways to keep the job going smoothly.

• • •

Good pipe and good service—that's why NATIONAL Seamless Pipe has figured prominently in virtually every important pipe line project of recent years. Don't miss these important advantages.

NATIONAL TUBE COMPANY

PITTSBURGH, PA.

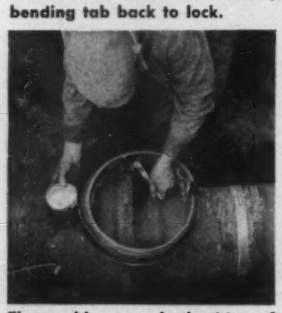
Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Export Company, New York

UNITED STATES STEEL

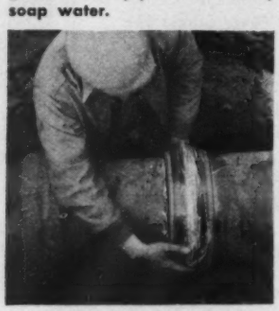
One man - 15 minutes!

SKINNER-SEAL SPLIT COUPLING CLAMP — THE ONE QUICK, PERMANENT REPAIR FOR BROKEN MAINS!

Clean pipe thoroughly — then center brass band over break, bending tab back to lock.



Thoroughly soap both sides of gasket and pipe with heavy soap water.



Center gasket and Monel Band over brass band.

Assemble halves of clamp over pipe and bolt together.

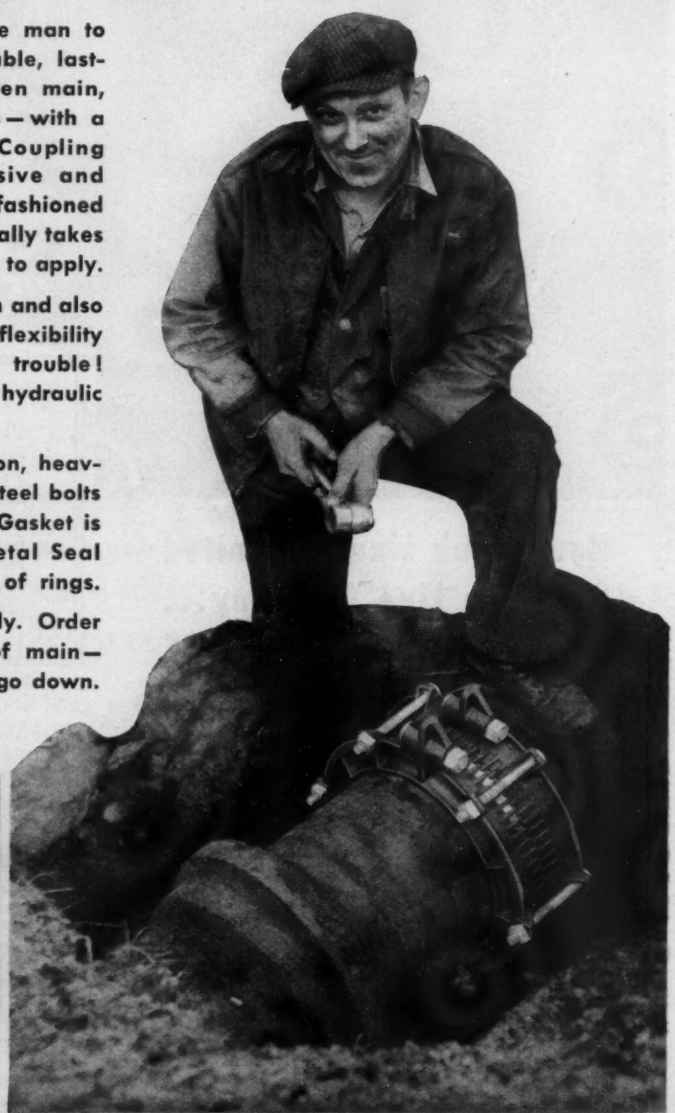
Insert pull bolts and tighten all around evenly.

● IT'S EASY for one man to make a dependable, lasting repair of a broken main, in 15 minutes or less — with a SKINNER-SEAL Split Coupling Clamp! Less expensive and lighter than the old-fashioned split sleeve, which usually takes 2 or 3 men 3 or 4 hours to apply.

Splices the broken main and also provides a degree of flexibility which prevents future trouble! Easily passes 600 lb. hydraulic pressure test!

Made of malleable iron, heavily enameled. Sturdy steel bolts are cadmium plated. Gasket is SEALED by Monel metal Seal band, under pressure of rings.

Thousands used yearly. Order today for each size of main — watch repair expense go down.



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BUYERS GUIDE TO AUTOMATIC GAS HEAT

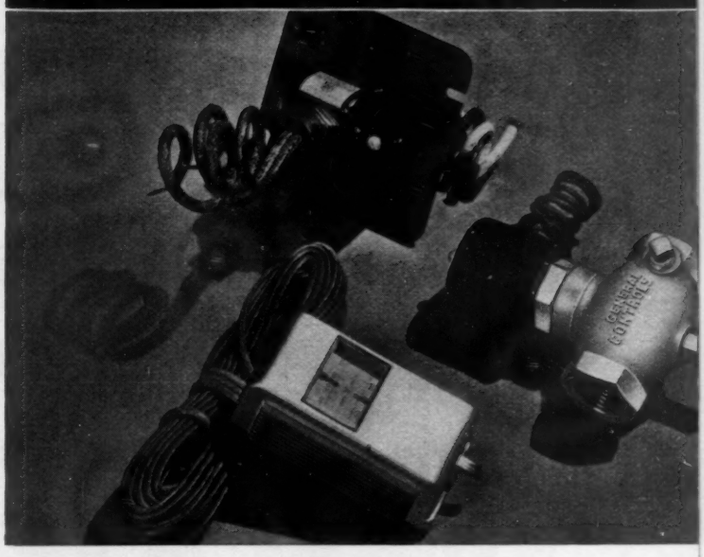
GENERAL CONTROLS GAS HEATING PACKAGE SETS

... They're just right!

THE MOST VERSATILE, POPULAR AND LOGICAL LINE OF AUTOMATIC GAS HEATING CONTROLS FOR RESIDENTIAL, COMMERCIAL AND INDUSTRIAL INSTALLATIONS

T-30 GAS HEATING PACKAGE SET

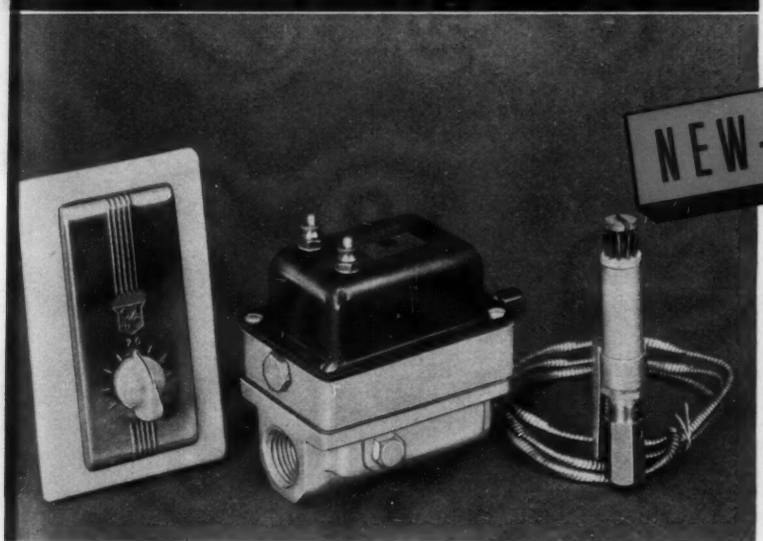
For gas-fired boilers, conversion burners, floor furnaces, warm air, blower and gravity furnaces.



This is the popular General Controls T-30 Gas Heating Set. It includes a silent Type K-3B two-wire gas valve, a T-70-1 attractive two-wire Metrotherm, transformer and 30 feet of wire. Available with night shut-off. Thousands of installations proved that they're easy to buy, easy to sell, easy to install. In fact, *they're just right!*

B-60-6 GAS HEATING PACKAGE SET WITH REMOTE OR INTEGRAL THERMOSTAT

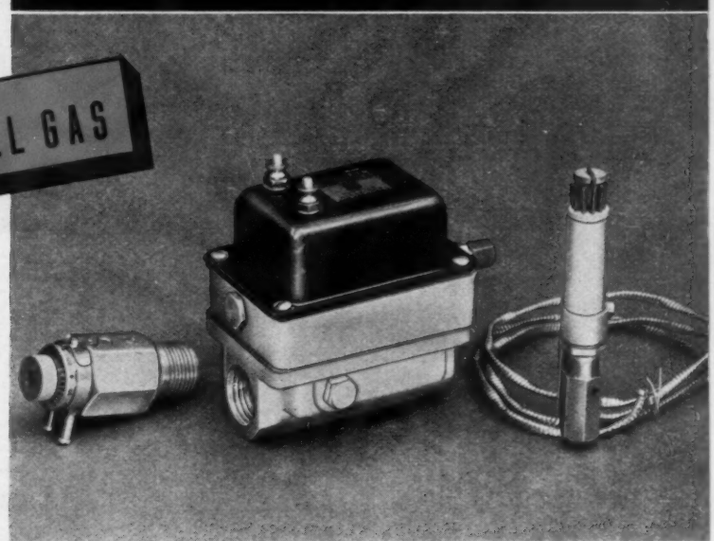
For space heaters, gas-fired steam radiators, wall and radiant heaters, range heaters, floor furnaces, etc.



These amazing and versatile *all-gas actuated* controls are the newest and most modern of General Controls' gas valves. Remember, no electricity is needed; these valves generate their own current. Valves are silent, safe and 100% positive in operation. This popular set includes a new B-60 gas valve, pilot generator, remote room thermostat, or thermostat integral with valve.

B-60-6 GAS HEATING PACKAGE SET with TANK THERMOSTAT

For automatic, sensitive and visible control of water heaters.



In water heater installations, the compact, sensitive tank thermostat mounts in side of tank, permitting wiring to be brought up through the heater casing, making a streamlined installation. The gas valve is installed under the heater. Setting knob on thermostat provides easy adjustment. No noise of any kind, starting, stopping or operating. Pilot generator acts as ideal safety pilot. The set includes B-60-6 valve, pilot generator and tank thermostat.

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SIMPLICITY—unskilled labor assembles standard parts on plain-end pipe, using only a wrench.

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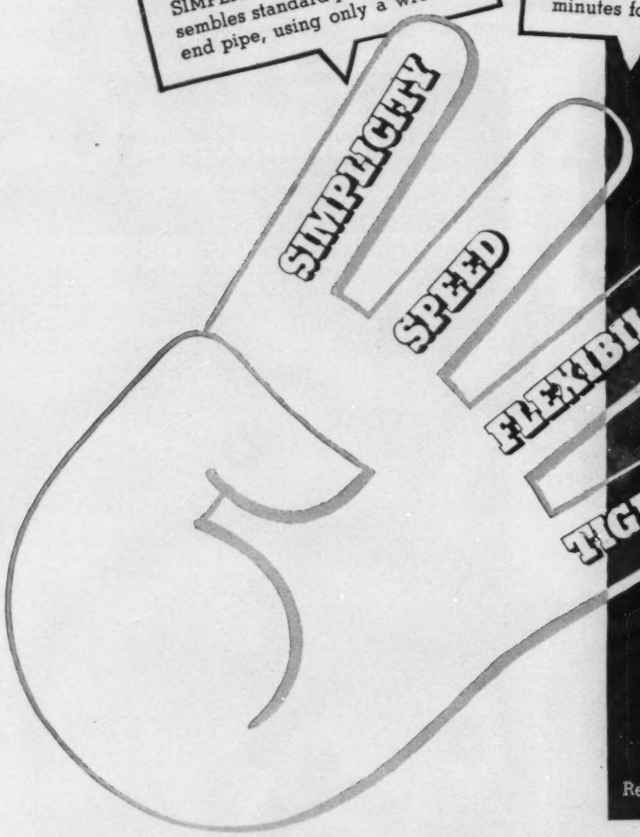
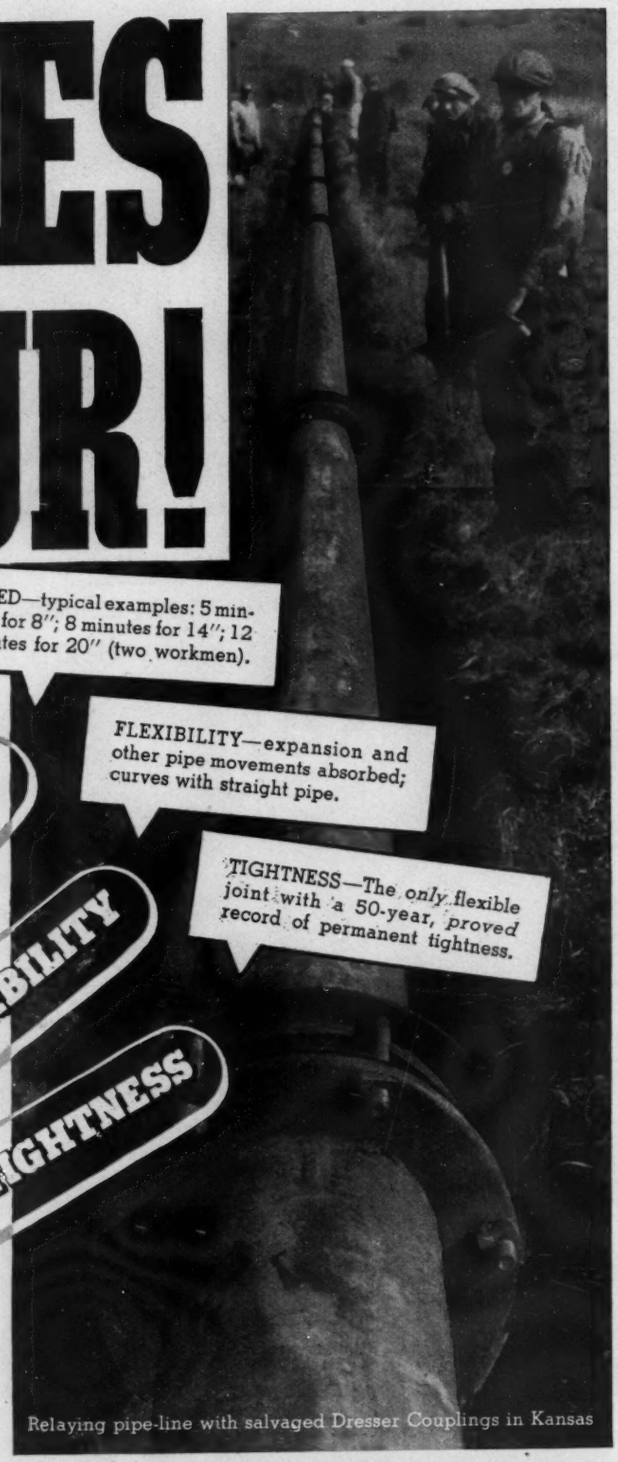
FLEXIBILITY—expansion and other pipe movements absorbed; curves with straight pipe.

TIGHTNESS—The *only* flexible joint with a 50-year, *proved* record of permanent tightness.





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No pipe-line builder can escape this simple truth. To get TRUE Economy in your pipe-joints, you must have "ALL FOUR"—*Simplicity, Speed, Flexibility, Tightness.* • In short, it takes "ALL FOUR" to give you faster construction, reduced costs, *complete satisfaction.* Dresser users have benefitted by this fact for almost 50 years because *only Dressers Give You "ALL FOUR"!*

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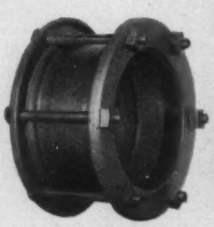

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PIPE COUPLINGS

FITTINGS?—We make a complete line of Long, Cast, Reducing, and Insulating Couplings; also steel and malleable ells, tees, crosses, etc. Write for our General Catalog Number 36.

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GENERAL OFFICES ★ CLEVELAND, OHIO

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SILENT SENTINELS of the GAS INDUSTRY

CBV Direct Connected Reliance Regulator

CBV Offset Connected Reliance Regulator

Silent, neglected, forgotten, exposed—and still sentinels.

A Reliance Regulator accepts more responsibility and performs with greater reliability than any other piece of critical equipment on your lines.

Shoot your gas in at a thousand pounds and take it out at two and a half—or two hundred—or what you like.

At any outlet pressure, a Reliance Regulator has greater capacity—more flexibility under variable loads—than *any other regulator of the same size.*

In any service—distribution, industrial or domestic—on any gas—manufactured, natural or liquid petroleum—a Reliance Regulator of the proper type can soon be written off your books by its improvement of customer relations and its visible savings year after year.

Investigate—two ways—by sending for a bulletin on your particular problem, and by asking the utilities that use Reliance Regulators what they think about them.

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1000 Meridian Avenue, Alhambra, Calif.

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RELIANCE
SINCE 1910

RELIANCE REGULATORS

The ONE Trencher that Really FITS THE JOB—

CLEVELAND "BABY DIGGER"

FOR GAS DISTRIBUTION WORK

WATCH YOUR COSTS GO DOWN

THE FOLLOWING CLEVELAND-PIONEERED FEATURES TELL WHY——

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Manufacturer of A Complete Line of Wheel and Ladder Type Trenchers—Backfillers—Pipe-Cranes and Mechanical Tampers.

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CLEVELANDS

A Sure Bet...

MRS. HOMEMAKER WILL ALWAYS BE THANKFUL SHE SELECTED A UNIVERSAL GAS RANGE!

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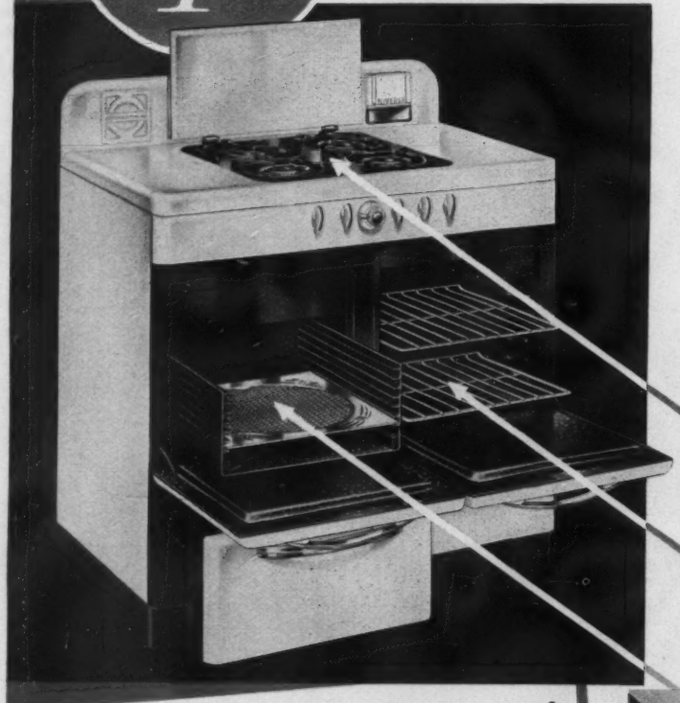


★ An important consideration with respect to any gas range is its ability to withstand the test of daily service in the home. The superior cooking service rendered by the Universal Gas Range is a factor that is more and more impressed on the Homemaker as her knowledge and familiarity with the range itself increases. In every division of cooking, Universal presents such a radically improved performance, as compared to the ordinary gas range, that Universal actually transforms the entire process and procedure of meal preparation. It eliminates the fuss, the bother, the worry and the toil formerly associated with cooking. Thus, on the basis of service rendered, the Homemaker who installs a Universal in her home is proud of the fact that she not only made a good selection, but also a wise investment in lasting cooking satisfaction.

* * *

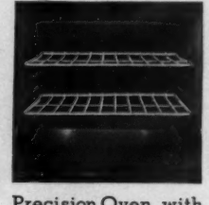
Illustrated is the new Argyle Universal elevated broiler gas range. The Argyle elevated broiler is unusually spacious, with an exceptionally deep broiler drawer, thus affording full use value for the broiling of all types of food. The Argyle is the lowest priced elevated broiler range which Cribben and Sexton Company has ever developed, and is representative of the outstanding values offered by Universal for 1940.

And here's why it's a good bet for the Gas Company

Mrs. Homemaker chose a UNIVERSAL

1. Universal creates greater public good-will, as it tends to bring about greater appreciation on the part of the consumer as to the real merit and worth of gas as the ideal cooking fuel. 2. It presents the perfect answer from the standpoint of adequately meeting electric cooking competition, as Universal, with its advanced devices gives a new and higher standard of automatic, controlled cooking performance.

In-A-Drawer Broiler with Savory Smoke-Proof Grid is the greatest combination of broiling devices on the market today —it definitely eliminates smoke.



Precision Oven, with its high speed, low temperature oven burner, gives the maximum in fuel economy, plus the guarantee of successful oven cooking results.

Simmer - Save, with controlled boiling heat at click of valve, plus a true warming heat, offers new fuel saving, plus the greatest flexibility in a top burner.

UNIVERSAL GAS RANGES

MANUFACTURED BY CRIBBEN & SEXTON CO. ★ 700 N. SACRAMENTO BLVD. CHICAGO • ILLINOIS

GAS
FEBRUARY, 1940

GUEST Editorial

A MAJOR OPPORTUNITY

By FRANK C. SMITH
President, Houston Natural Gas Company

THE important thing for the gas industry to bear in mind in its consideration of the research program proposed by a special committee of the American Gas Association, created for that purpose, is that it is a six-point program. The six points of which it is made are as follows:

1. Promotion and development of fundamental research.
2. Better coordination of all research, fundamental and applied or industrial, by the industry.
3. Education and training of gas industry research workers.
4. Centralization of research activities without diminution of or interference with existing research work by existing facilities.
5. Better correlation of the results of research.
6. A better utilization of the fruits of research.

This is not a hit-or-miss program nor a shot in the dark. It is based on the experience of other industries, is modeled on their successful accomplishment, and is directed toward ends which the gas industry must accomplish or march at the tail-end of the business parade.

It is true that a new concept may have to be adopted by some in order to comprehend the scope and purposes of the program. The idea of spending hard-won earnings for basic or fundamental research, for instance, will be a wrench to that executive who has not informed himself of the enormous strides taken in the recent past, for example, by the chemical industry, and who is unaware of the revolutionary developments of that industry by means of discoveries which have come to light through a sound program of fundamental research, and not by accident.

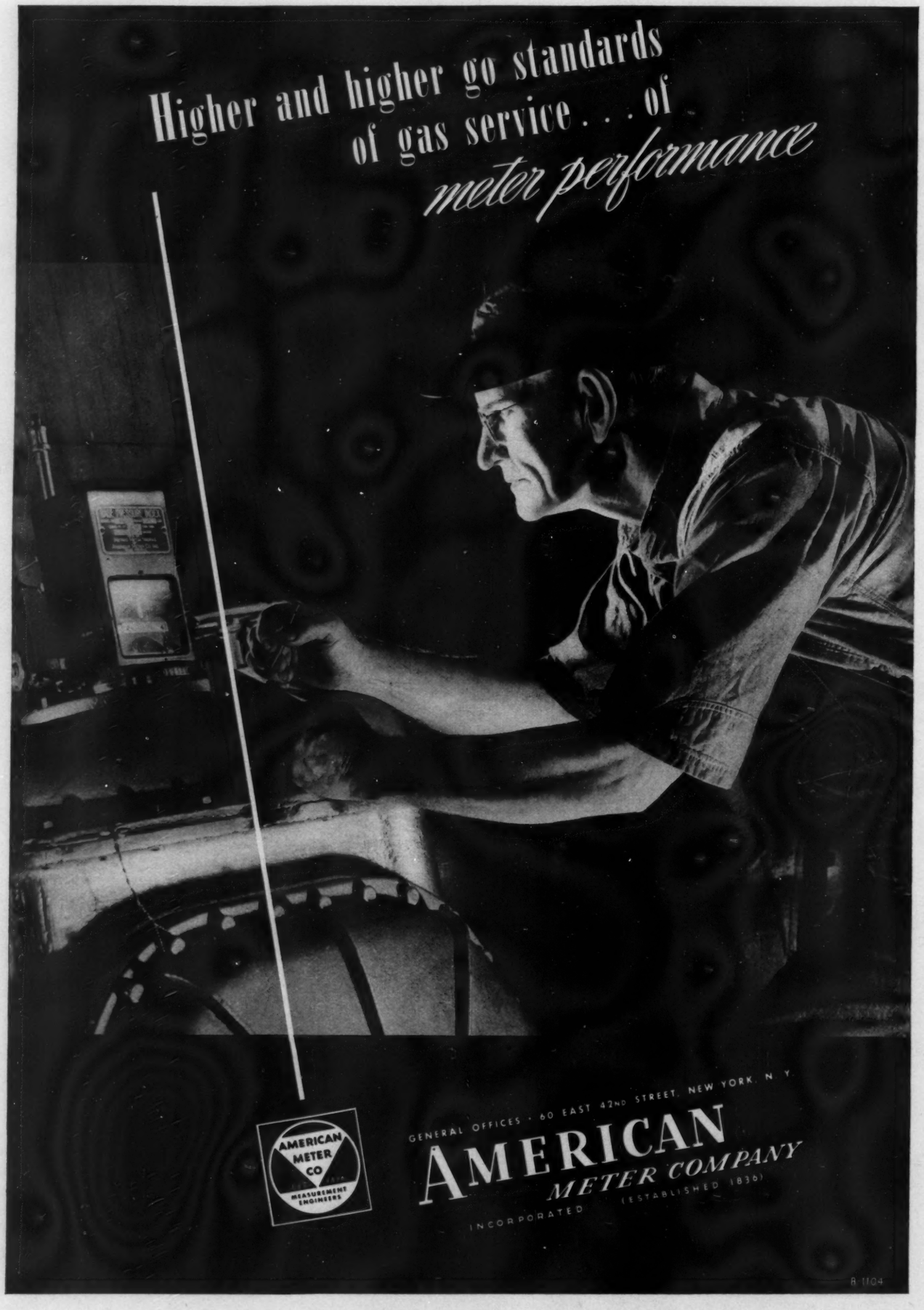
It may be a wrench to the executive who has not realized the need for the advanced training of the gas industry's research workers.

There may be some who have not sensed the fact that public confidence and respect are reposed principally in those industries which have shown that they are alert to the possibilities of the future as well as to the actualities of the present, and that this confidence and respect are vital factors in public and private estimate of an industry's desirability as an investment.

IF "Ours Is a Selling Job" — and I believe it is — our sales relations and resulting sales volume will get a tremendous lift from the public's realization that the gas industry is "on the march" and is utilizing every instrument available to modern business in this march of progress.

Industry-wide adoption and support of an adequate program of research will indicate that the gas industry means to keep abreast of the times and take advantage of its opportunities; it will mean, in other words, that the gas industry is growing; not standing still nor falling back.

Cooperation of every unit of the gas utility industry with the research program can best be achieved at this time by a prompt response to the questionnaire on present research practices now being circulated throughout the industry.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THERMALLY *Thinking*

Charles Remschel, Power Engineer

In many parts of the United States and most certainly on the Pacific Coast the name of Charles Remschel, power engineer for the Southern Counties Gas Co., Los Angeles, has been long and widely recognized as that of an authority on the gas engine and its applications. Mr. Remschel's experience with gas engines, according to his co-worker, Manley H. Clark, dates back some 20 years, and during all of those years, he has been continually and systematically making written notes, compiling statistical data, and creating charts and drawings that would enable him to do a better job in gas engine power applications.

In July of 1938 it was suggested to the American Gas Association Gas Engine Power Committee under Chairman E. P. Kramer of the Atlanta Gas Light Co. that it publish a *Gas Engine Handbook*, and in August of that year, Mr. Remschel, from his long-compiled notes, presented as a gift for the "good of the industry" his first draft of the Handbook. Mr. Remschel's contribution was gladly accepted and in the latter months of 1939, with only minor revisions, *The Gas Engine Handbook* was published.

With the publication of this handbook, the Gas Industry has received one of the most important and beneficial gifts that an indivdual ever made for the "good of the industry." And therefore, gas men will certainly agree that high upon the list of names of those chosen on the Gas Industry's All-American Team for 1939 should appear the name of Charles Remschel, power engineer.

Health Means Safe Workmanship

If a man is to enjoy his daily task and to accomplish his work both safely and well, he soon discovers — whether he be manager or messenger — that his most precious possession is his physical well being. And wise indeed is that company which takes an ever increasing interest in this phase of its employe's life.

On page 37 of this issue, Mr. G. W. Cannon, vice president of a midwestern foundry, relates what happened when his company put to work in its shops the principles of good health. And Mr. Cannon does not dwell upon philanthropy, but rather upon a surprisingly good way to make money.

Mr. Cannon's remarks were compiled as a member of the National Association of Manufacturers' Committee on Healthful Working Conditions, which was founded two years ago for two basic purposes. The first of these was to promote the good health of industrial employes, especially in the smaller sized plants, many of which have lagged behind the progress of the larger companies; and the second, to assemble all available information on good health, its cost and returns to a company, and on occupational disease, its costs and prevention in a company, with the purpose of making that information available throughout the industry.

Mr. Cannon found that his company's health program paid dividends in three directions — first, in dollars and cents through accident prevention and reduced lost time for sickness; second, in building the health of his employe group to a higher level; and third, in creating in his staff a trust and feeling of goodwill for a company whose first concern was to bring to its employes a more abundant life.

Industrial Show Windows

An editorial urging the advisability of properly arranged and attractively decorated show windows would be out of date today, so universally have the utilities come to recognize the value of these avenues to public attention and interest.

Properly enough, the show windows of a centrally located gas company are looked on primarily as an aid to merchandising both service and appliances. But it is always well to recognize that the enthusiasm that we may feel for a piece of merchandise is not necessarily shared in the same degree by the casual pedestrian who hurries by, his mind firmly fixed on his own schemes and problems.

To be effective, show windows must create and maintain a high degree of attention value in their own right, if they are to compete successfully with the thousands of distractions that a busy street has to offer. One way to accomplish this, and a way that

is worthy of more widespread use than it now enjoys, is to set aside a window or windows to be used for the display of local manufactured products in the making of which gas has a part.

Provided the displays themselves are intelligently conceived and well executed, this institutional type of window has many advantages. First of all, it can create the required high attention value, by capitalizing on the fact that everyone is interested in knowing how things are made.

It serves as a builder of good will with industrial consumers. In most instances local manufacturers are not located on heavily traveled streets, and they welcome an opportunity to bring their story uptown as guests of the gas company.

There is also a strong appeal to civic pride, especially in smaller communities, on the theme of "know your city and its products." Educationally, the public is reminded of a sometimes neglected fact — that gas is not limited to its domestic role of household servant. Even utility employes need to have that brought to their attention frequently.

Ranges, water heaters, refrigerators and furnaces will always be the keystone in the arch of utility displays; but the indirect benefits accruing from rotating industrial display windows should not be overlooked.

Press Relations

Contrary to the opinion that appears to prevail in certain quarters, the way to put our best foot forward in relations with the newspapers is not to place the toe of it literally or figuratively in contact with the seat of the reporter's pants.

The newspapers have nurtured with deepest solicitude their own inviolate right to maintain the freedom of the press. And the fact that that freedom sometimes takes the form of unfair and biased reporting, and intellectually dishonest criticism, particularly of public utilities, is something that, like a bad spell of the lumbago, we might as well be philosophical about, taking care that we do nothing to aggravate the situation.

The best press relations are almost invariably maintained when they are placed and left in the hands of a competent contact man who knows what the newspaper business is all about. He knows, for instance, that when a story is hot, the reporter assigned to it has to come in with the story and not with an alibi. This being the case, he proceeds to dispense the information requested, putting the best construction possible on it from the standpoint of his own company. By so doing he saves wear and tear on the reporter's nerves and disposition, which is reflected more often than not in a mollified tone evidencing itself in the written copy.

He knows, too, that stories of a publicity nature are most likely to make all editions when they are slanted to the angle of each paper's editorial policy; and he can tell with fine shades of distinction just what each important newspaper's policy is.

He knows that every line that appears in print has been written by a human being like himself, and human beings since time began have had a penchant for doing occasional favors for their friends. Without overdoing the thing to the point of the obvious, he devotes himself to the cultivation of friendships that will do him and his company some good.

The best personality that any public utility has in its personnel is not too good a man for this important function, regardless of the title that he may have lettered on his office door. His every contact is multiplied by hundreds of thousands, often by millions. And the attitude that he personally engenders in the working press will be in a large degree the attitude that the millions will accept as representative of his company.

Your Company Library

One very important and seldom discussed department in a large utility is the company library — for it is to the library that the employe turns when he wishes to uncover facts about his company. In a recent article from the *Executive Service Bulletin* by Alma C. Mitchill, librarian of the Public Service Corporation of New Jersey and president of the National Libraries Association, it was learned that of that corporation's 20,000 employes, some 50% were taking advantage of the library's facilities. This didn't just happen, but is a direct result, according to Miss Mitchill, of the company's realizing some 28 years ago that the maxim, "It Pays to Advertise," is just as true for business libraries as it is for the business houses. In Miss Mitchill's words:

> "As an auxiliary to our service, we have, during the past year, printed and distributed among employes a booklet entitled *Scope and Purpose of Public Service Library*. This sets forth the purpose of the library, gives its rules and regulations, lists the magazines to which it subscribes, names the subject headings for books and pamphlets, and offers a list of miscellaneous and reference material.
>
> "... The library issues two bulletins for the executive and department heads. One is entitled *Library Broadcasting*, and gives information in concise form on rate changes, business conditions, new incorporations, current market prices, labor conditions, commission rulings, court decisions, and new construction projects as they appear from day to day in the technical and financial press. The second bulletin, *Across the Librarian's Desk*, notes new pamphlets and reports as they are issued and makes a brief comment on each. Another library service is to compile, upon request, bibliographies on any subject."

It is obvious that the more you as employes know about and use your company library, the more you will understand and appreciate the service which the company renders the public — and the more intelligently you will be able to talk about — and that means sell — gas service in your activities beyond the job among family and friends.

THE INDUSTRY EXTENDS ITS SERVICE

By WALTER C. BECKJORD
President, American Gas Association

NATURAL and manufactured gas companies, supplying towns and cities with a population of almost 82,000,000, during 1939 served a total of 17,548,000 customers, representing the largest number of consumers ever connected to the mains of the industry and an increase of 376,000 over 1938.

Of these, 10,100,100 were served by the manufactured gas industry, 7,447,900 by the natural gas industry. Revenues of the entire industry, both manufactured and natural, aggregated $817,137,000, a gain of 5.2% over the preceding year of 1938. The natural gas companies grossed $449,073,000, a gain of 7.8% for the year, while revenues of the manufactured gas companies were $368,064,000, as compared with $360,494,000 in 1938, an increase of 2.1%. A statistical review of the natural gas industry is shown in Table No. 1, of the manufactured gas industry in Table No. 2, of the combined natural and manufactured gas industries in Table No. 3.

Just as 1939 has been a "banner" year for the gas industry, so also have gas appliance sales throughout the United States registered substantial increases over those of the previous year, according to a year-end statement by Frank H. Adams, president of the Association of Gas Appliance and Equipment Manufacturers. The rise is attributed to extended national promotion, increased advertising, constant improvement of product, and "consciousness" of consumer trends.

Mr. Adams, who is vice president of the Surface Combustion Corp., of Toledo, Ohio, said that the following increases in the sales of major gas appliance lines will be noted for 1939 as compared with 1938: house heating equipment, 45%; gas ranges, 32%; gas water heaters, 30%; and gas refrigerators, 30%. He estimated that shipments of gas ranges alone for the year 1939 will approach 1,350,000 units, which is considerably in excess of 1938 sales.

The several extensive sales promotion campaigns which the Association's product divisions have conducted during 1939 were credited with being major contributing factors to the year's favorable outlook. The CP gas range program and similar sales promotional endeavors in behalf of gas water heaters and gas refrigerators were prominent among these 1939 campaigns.

Preliminary estimates indicate that the total production of natural gas in 1939, including amounts used in the manufacture of carbon black and for field purposes, reached a total of 2,200,000,000,000 cu. ft. Approximately 192 billion cu. ft. of natural gas were used as fuel for generating electric power in 1939. This was an increase of nearly 13% over the previous year.

Gas companies continued to inaugurate more favorable rates for house heating through central plant burners and equipment. It is estimated that the total number of gas central house-heating installations connected to the lines of all United States gas companies in 1939 amounted to 900,000. In addition, there were approximately 1,600,000 dwellings heated by unit heaters, space heaters, floor furnaces, etc., giving a total of more than 2,500,000 homes in the United States that are heated by gas.

In recent years, the gas industry has supplemented the substantial amount of research conducted by gas appliance manufacturers by a vigorous and well-planned program of research and development through the American Gas Association. Even better and more efficient gas equipment will shortly be available, which should serve to enhance the competitive position of gas.

Gas is also receiving increased recognition in the air-conditioning field, where control of humidity as well as temperature is required. The problem of the gas industry is to develop acceptance of gas equipment by the existing air-conditioning distribution outlets, and to further assist them in obtaining public acceptance for this equipment. However, the first phase of this problem is the most important, for it has been pointed out that in most cases the average customer accepts air-conditioning performance without regard to the method used in obtaining it.

In order to obtain acceptance of gas-using equipment by the air-conditioning trade, an organized campaign of engineering education must eventually be addressed to the air-conditioning industry by the gas industry. This campaign must thoroughly acquaint the entire industry with the technical features of available gas equipment and how it fits the picture in each specific type of locality — as to its adaptability to geographic and climatic conditions,

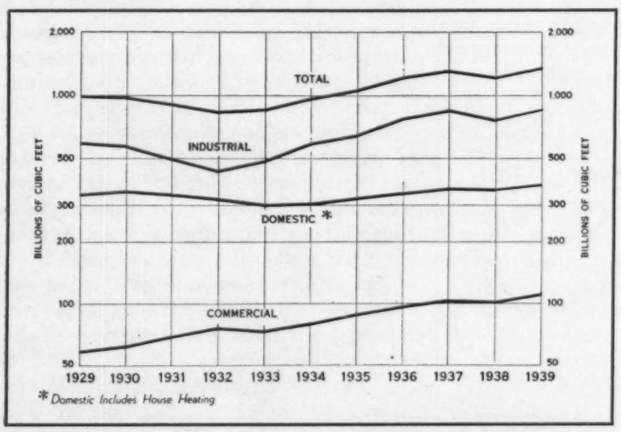


FIG. 1. Gas sales of the Natural Gas Industry (1929-1939).

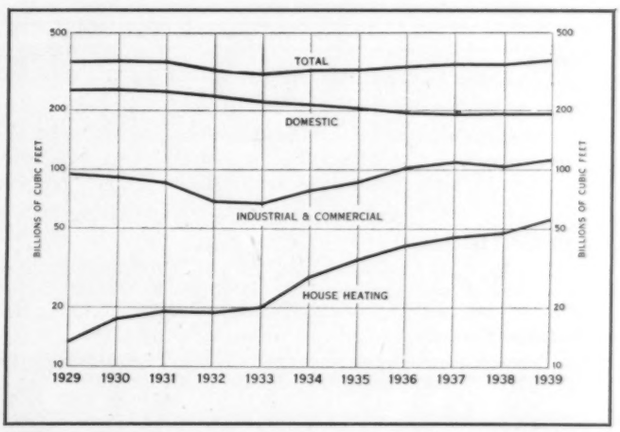


FIG. 2. Gas sales of the Manufactured Gas Industry (1929-1939).

local water conditions, rate structures, as well as its special adaptability to specific air-conditioning problems. The preparation and distribution of information of this nature would require the service of a central agency to compile general engineering data relative to gas equipment. This organization must sell every cooperating gas company on the necessity of assigning a trained air-conditioning man to work with the central agency in qualifying the possibilities for various gas devices in each territory. Such qualifications would involve a survey of the market to determine applications specially adapted to any given kind of gas equipment and to determine the competitive position of all gas-using equipment, both from the first cost and operating cost standpoint. After proper qualification has been made for each territory, data pertaining to favorable reported gas equipment should be presented to each engineering-contracting agency and to architects and engineers in the territory, together with a listing of especially favorable types of applications and favorable economic factors.

The use of gas for commercial and industrial purposes throughout the country is growing rapidly in volume. New outlets are presenting themselves in this branch of the industry. Recent marked changes in materials which go into dwelling structures calling for more use of structural steel, glass, brick, synthetic stone, metallized wood, fabricated steel and concrete in home construction are resulting in a correspondingly greater demand for use of gas in the production of these products.

TABLE NO. 1
PRELIMINARY ESTIMATES ON THE NATURAL GAS INDUSTRY FOR 1939

	1939	*1938*	*Per Cent Change*
Customers:			
Domestic (inc. House Heating)	6,860,400	6,665,000	+2.9
Commercial	543,900	524,000	+3.8
Industrial	43,600	42,000	+3.8
Total	7,447,900	7,231,000	+3.0
Gas Sales (M c.f.):			
Domestic (inc. House Heating)	376,613,000	352,964,000	+6.7
Commercial	110,541,000	100,951,000	+9.5
Industrial	655,389,000	589,398,000	+11.2
Electric Generation	192,144,000	170,039,000	+13.0
Total Ind. and Elec. Generation	847,533,000	759,437,000	+11.6
Total	1,334,687,000	1,213,352,000	+10.0
Revenue (Dollars):			
Domestic (inc. House Heating)	$256,732,000	$242,658,000	+5.8
Commercial	50,500,000	47,240,000	+6.9
Industrial and Electric Generation	141,841,00	126,682,000	+12.0
Total	$449,073,000	$416,580,000	+7.8

Statistical Department, American Gas Association.

TABLE NO. 2
PRELIMINARY ESTIMATES ON THE MANUFACTURED GAS INDUSTRY FOR 1939

	1939	*1938*	*Per Cent Change*
Customers:			
Domestic	9,369,300	9,248,000	+1.3
House Heating	261,700	227,000	+15.3
Commercial	423,500	421,000	+0.6
Industrial	36,400	36,000	+1.1
Miscellaneous	9,200	9,000	
Total	10,100,100	9,941,000	+1.6
Gas Sales (M c.f.):			
Domestic	193,830,000	197,052,000	—1.6
House Heating	55,537,000	47,918,000	+15.9
Commercial	55,599,000	54,032,000	+2.9
Industrial	55,645,000	47,398,000	+17.4
Miscellaneous	1,979,000	2,244,000	
Total	362,590,000	348,644,000	+4.0
Revenue (Dollars):			
Domestic	$257,523,000	$258,357,000	—0.3
House Heating	36,025,000	31,030,000	+16.1
Commercial	47,419,000	46,718,000	+1.5
Industrial	25.803,000	22,855,000	+12.9
Miscellaneous	1,293,000	1,534,000	
Total	$368,064,000	$360,494,000	+2.1

Statistical Department, American Gas Association.

TABLE NO. 3 — PRELIMINARY ESTIMATES ON THE GAS INDUSTRY FOR 1939

	1939	*1938*	*Per Cent Change*
Customers:			
Domestic (inc. House Heating)	16,491,400	16,140,000	+2.2
Industrial and Commercial	1,056,600	1,032,000	+2.4
Total	17,548,000	17,172,000	+2.2
Gas Sales (M c.f.):			
Domestic (inc. House Heating)	625,980,000	597,934,000	+4.7
Industrial and Commercial	1,071,297,000	964,062,000	+11.1
Total	1,697,277,000	1,561,996,000	+8.7
Revenue (Dollars):			
Domestic (inc. House Heating)	$550,281,000	$532,045,000	+3.4
Industrial and Commercial	266,856,000	245,029,000	+8.9
Total	$817,137,000	$777,074,000	+5.2

Statistical Department, American Gas Association.

New Developments

In the field of industrial utilization new processes have been developed and equipment with improved efficiencies has come into general use. For example, a few years ago there was a distinct trend in the larger newspaper offices of the country toward metal melting by electricity for stereotyping and other purposes. Through the American Gas Association's cooperative research with manufacturers, methods have been developed resulting in general acceptance of gas heat for these purposes by the newspaper industry.

For the fourth consecutive year the gas industry has sponsored a national cooperative advertising program, the objective of which is the promotion of gas as the modern, efficient fuel for household, industrial and commercial purposes. Sentiment for the program is stronger now than at the beginning.

During the 1939-40 campaign, full-page, four-color advertisements are appearing in consumer magazines having a circulation of 17,658,000 copies per issue. This is augmented by other full-page advertising appearing in 22 trade and professional magazines, and by a large and growing volume of local gas company and dealer newspaper advertising built around the themes of the national campaign.

The Association's Executive Board has approved a continuation of this program to June, 1942.

The A. G. A. All-Gas Home Program showed continued progress the past year. The Builders' Competition closed on July 21, 1939, with over 2100 prominent builders from all parts of the country officially registered in the competition. Over 300 entries of All-Gas houses actually built in the two-year period ending July 31, 1939, were received and a large amount of favorable gas publicity appeared and is still appearing in the national press and the leading architectural, building and consumer magazines.

The All-Gas Home

Gas utility companies in all parts of the country are cooperating with the All-Gas Demonstration Home Program. More than 30 All-Gas demonstration homes have been constructed throughout the nation, and it is expected that additional All-Gas homes will be constructed during the spring of this year.

In addition to promoting the A.G.A. All-Gas Home Program, the Association actively engaged in promoting the *Life* Housing Program sponsored by *Life* Magazine with the first six homes open for demonstration throughout the country using "gas for the 4 big jobs" with gas dominating the balance of the homes constructed. Recognizing that the increase in new home construction will continue during the coming year, the Association is continuing its activities to promote the construction of All-Gas Homes and to cooperate with all housing programs of merit.

Adequate publicity regarding the A. G. A. All-Gas Home Program will appear in the *American Builder* and *Building Age Magazine* and other publications during 1940.

On August 1, 1938, the American Gas Association set up Certified Performance Requirements to create gas ranges that excel in cooking performance. Since that time 25 range manufacturers have produced more than 400 models of gas ranges meeting these requirements, and more than 100,000 CP gas ranges have been placed in American kitchens. This new buying guide for modern cooking appliances has also had the effect of increasing the number and raising the quality of other gas ranges sold. Total gas range sales during 1939 were approximately 30% higher than the previous year, and more than 80% of these ranges were equipped with oven heat controls. The Association of Gas Appliance and Equipment Manufacturers reports substantial increases in the sale of every major type of gas appliances and equipment during 1939.

Located in the Brooklyn Union Gas Co. building on Long Island, The Gas Mart is to be a permanent display of commercial and domestic modern gas appliances.

The Gas Mart

By G. F. B. OWENS

Assistant Vice President, The Brooklyn Union Gas Company

THE Gas Mart, sponsored by the five gas companies of Long Island, was previewed January 24 and 25 when architects, builders, newspaper representatives, and dealers inspected this cooperative enterprise which performs the major functions of bringing the products of manufacturers to the ultimate consumers and of simplifying dealer-manufacturer-utility relations in Long Island's four counties — Kings, Queens, Nassau and Suffolk.

The Gas Mart is a permanent display devoted exclusively to a continuous showing of the latest modern gas appliances. It will furnish the means of closer cooperation among the gas utilities, the manufacturers and the dealers with respect to advertising, financing, dealer relations and sales campaigns. It will become a central hub from which all activities may emanate, utilizing the full power of the gas industry in this area to present to the public a united effort.

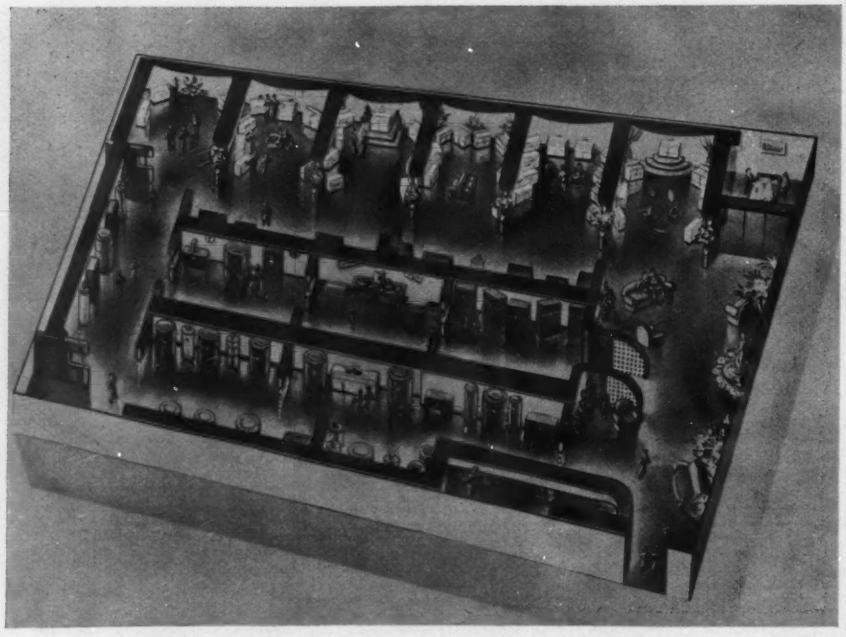
The five utilities cooperating in sponsoring this program are the Brooklyn Union Gas Co., the Brooklyn Borough Gas Co., the Kings County Lighting Co., the Long Island Lighting Co. and the Queens Borough Gas & Electric Co.

The Gas Mart is served by an information bureau staffed with a capable personnel. The bureau will have on hand at all times complete information with regard to equipment, prices, financing and dealer arrangements for both the customer and the dealer.

In the same building which houses the Mart there is also an auditorium available for public use as well as for educational and sales meetings for dealers and salesmen. This auditorium provides the manufacturers with an easy means of holding previews of their new equipment for utility and dealer groups.

Adjacent to the building is an enclosed parking space for automobiles, which will be flood-lighted by gas, demonstrating the feasibility of gas for outdoor lighting.

Located in the Brooklyn Union Gas Co. Building at 2950 Atlantic Avenue, which is near the Brooklyn and Queens boundary line, the Gas Mart is easily reached from any point in the four counties. This central location is important to the manufacturer from the standpoint of moving his equipment in and out of the Mart for an inspection of an extensive line of gas appliances. The central location also makes it convenient for holding meetings of dealers



On display at The Gas Mart, which was previewed Jaanuary 24-25, are the representative lines of 23 manufacturers of modern gas appliances.

and sales people. Thus the Gas Mart can well serve as a distribution center for gas appliance merchandising activities on Long Island.

The Gas Mart's display of modern gas appliances is most comprehensive in quantity, quality and variety. This display of the representative lines of the products of 23 manufacturers is advantageous to the manufacturers, the gas utilities, the dealers and the public. It allows every manufacturer to place his products before the public and more than 2000 listed dealers. It enables the gas companies to broaden their gas appliance lines without additional expense in order that they may more accurately serve their customers' needs. The Mart gives the local dealer a better opportunity to sell his products because he has been given a complete showroom for his own use, together with other advantages offered by the utilities to the dealers. It complements his own local display and ties him in as a definite part of a broad activity. The dealer's big job now becomes locating the prospect, taking him to the Mart and turning the prospect into a sale.

Beneficial Effect

The effect of the Gas Mart on the public should be a beneficial one to all the agencies cooperating to make it a success, for this Mart demonstrates the manner in which the gas industry is prepared to serve the public. It shows Mrs. Homemaker a variety of modern automatic gas appliances which will serve her needs for cooking, refrigeration, water heating and house heating. It will also be of interest to managers and owners of stores and factories, as commercial heating equipment will be on display. The effect will be a continuous one in view of the fact that the Gas Mart will be a permanent display. Its ultimate aim is to have the prospect for the "Four Big Jobs" visit the Gas Mart before making a decision to buy.

Previously each of the utilities could deal only with a few manufacturers and select a portion of their lines for display and sale. The handicaps of the manufacturers in the past, because various physical limitations prevented handling more lines and lack of direct connection with the utilities, can be realized readily. This situation is now remedied through the Gas Mart because representative lines of all participating manufacturers are on display. The manufacturers will now be in a position to promote their products aggressively throughout Long Island on an equal cooperating basis.

The gas utilities will advertise the Gas Mart through their standard mediums. They will be able to promote the Mart by means of bill enclosures, broadsides, newspaper advertising, truck signs, window and floor displays. A cooperative newspaper advertising program, using the Mart as a central theme, is being planned to advertise the "Four Big Jobs" to the residents of Long Island. Supporting the efforts of the utilities will be the promotion of the manufacturers and the dealers tying in with the general campaign. Following up their determination to present a united effort both in appeal to the public and in competition with others, the gas utilities will strive for similarity in merchandising, dealer and financing methods. With the completion of these plans, gas appliance merchandising will be on a sounder basis and take a more definite place in the minds of the public.

Distribution Facilitated

We believe that with the introduction of the Gas Mart as the gas appliance distribution center of Long Island we have taken a forward step in merchandising. We have facilitated distribution of the products of manufacturers to ultimate consumers. We have given a large number of manufacturers the opportunity to place their products before Long Island's 4,500,000 residents. We have given dealers the opportunity to have a comprehensive display as an aid to their sales efforts. We have started to impress definitely upon the public the satisfactory manner in which gas appliances and gas fuel meet Mrs. Consumer's needs in cooking, refrigeration, water heating and house heating. We have rounded out dealer-manufacturer-utility cooperation.

We have, in brief, effected a cooperative effort for the gas industry. With the real cooperation anticipated this united effort will make a favorable impression on the public and bring profitable results to manufacturers, gas utilities and dealers.

■ ■

Portland Gas & Coke Plans For Future Expansion

With the purchase of 36 acres of land in the industrial district, 1000 ft. of it water frontage, the Portland Gas & Coke Co., Portland, Ore., is ensuring itself room for the large expansion expected in the near future. The location is immediately adjacent to the gas and by-products plant on St. Helens road.

Additional evidence of the company's plans for increasing its by-products business is contained in the recent announcement that $600,000 of new capital for such purposes will become available through the American Power & Light Co., New York, parent company, if the 10-year bond extension program now before bondholders is put into effect.

■ ■

Metropolitan Edison Seeks To Serve Natural Gas

Application to the Public Utility Commission, of Pennsylvania, for permission to substitute natural gas for manufactured gas for Lancaster county customers in Marietta, Elizabethtown and in East and West Donegal Townships, has been made by the Metropolitan Edison Co., Reading, Pa.

The company plans to purchase natural gas from the Manufacturers Light & Heat Co., of Pittsburgh.

THE FORMATION OF SCALE AND METHODS OF ITS PREVENTION IN WATER HEATERS

By J. M. KRAPPE Associate in Gas Engineering, Purdue University

SOME individual observations have been made which show that scale formation where hard water is served is effected by the temperatures maintained by the heater. However, no laboratory verification of this observation had been obtained, nor was it known whether temperature was a major factor in the formation of scale deposit in a water heater. Furthermore, it is difficult to compare experiences from various territories since such other variables as the comparative hardness of the water, the type of hardness, the quantities of water used, and the design of the heater were known to have an influence. Some field experiences have shown in a rough way that high tank temperatures resulted in rapid scale formation. For example, in a physician's office where water temperatures of 180° F. or over were required, it was found that the tank required cleaning quite frequently, whereas the identical type heater installed in a home required very little service as long as the temperature was maintained below 140° F. Other instances of increased scale formation at high temperatures are a matter of common observation. It is well known that furnace coils and uncontrolled water heaters using the crude fuels give considerable difficulty. For example, in some territories it is necessary to replace or clean furnace coils once or twice a year. It is assumed that the rapid formation of a hard scale in this case is largely due to the uncontrolled water temperature. It is quite possible for a furnace to deliver water at temperatures as high as 200° F. when the house-heating furnace is operating at maximum capacity.

With domestic gas-fired water heaters of the automatic type, instances of difficulty with scale formation were not as numerous. In many cases it was reported that domestic gas water heaters equipped with temperature controls showed no difficulty from scale formation after periods as long as eight years, where the thermostat maintained water temperatures at 140° F. or lower.

It has also been observed that small passages or relatively small water tubing in the heat zone have a tendency to become clogged. Hence, the side-arm type heaters and instantaneous heaters using relatively small diameter coils are often considered to be offenders from this viewpoint.

From these experiences the various types of water heaters may be classified in the following order with respect to their tendency to give service difficulty from scale formation.

1. Furnace coils.
2. Water heaters not equipped with temperature controls.
3. Manual side-arm type of water heaters.
4. Automatic side-arm type of water heaters.
5. Instantaneous or continuous flow type without thermostat.
6. Instantaneous or continuous flow type with thermostat.
7. Automatic underfired water heaters with internal flues.
8. Automatic underfired heaters with external flues.

In order to obtain information on the effect of temperature alone it was considered desirable to select a given type of heater and test at three different outlet temperatures under laboratory control. For the purpose of obtaining the information in the shortest possible time the heater was operated continuously day and night at the manufacturer's rated capacity. Furthermore, the test method differed from usual service recommendations in view of the fact that the drain valve at the bottom of the heater was not opened at any time during the test. Nevertheless, the results were comparative for the different temperatures and gave a definite indication that the rate of scale formation increased quite rapidly with

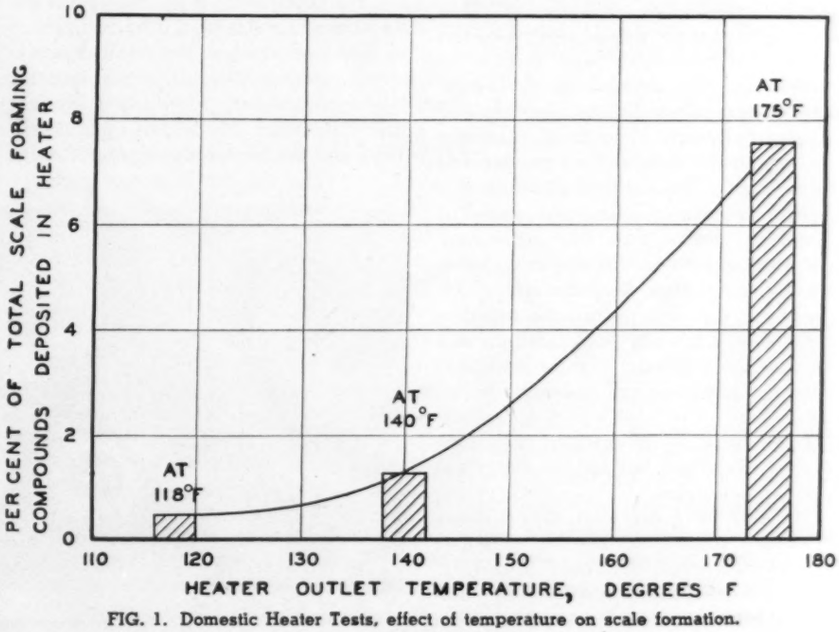


FIG. 1. Domestic Heater Tests, effect of temperature on scale formation.

TABLE NO. 1. WEIGHTS OF HARD WATER SCALE REMOVED FROM CONTINUOUS FLOW TYPE HEATER

(Total Water Usage 63,500 Gallons at 180 Degrees Fahrenheit)

Unit	*Weight Before Scale Removal Lbs.*	*Weight After Scale Removal Lbs.*	*Difference in Weight Lbs.*	*Internal Area of Each Unit Sq. Ft.*	*Weight of Scale Lbs. Per Sq. Ft. Internal Area*
Combustion Chamber Coil	11.2	8.4	2.8	3.8	0.74
Top Finned Heating Element . .	20.5	19.5	1.0	1.85	0.54
Lower Finned Element (Thermostat Rod)	5.0	5.0	....	.....	None
Tee and Pressure Relief Valve* .	0.62	0.62	....	.....	None

*Pressure relief valve located at cold water inlet to heater.

the temperature maintained. A very rapid increase in the rate of scale formation as shown graphically on the chart, Fig. 1, was obtained between 140° and 180° F. In fact the rate of scale formation at the higher temperature was seven times as great as that at normal domestic service temperatures.

The heater for which these results were obtained was a domestic type quick recovery gas water heater having an internal flue. It was surprising to note that the thermal efficiency of the heater did not decrease appreciably from the beginning to the end of each test. Apparently these underfired storage type heaters have an ample amount of heating surface and even though the lower surfaces may contain scale deposits there is sufficient heating area remaining to give efficient heat transfer.

Five-Year Test

When the heater was operated at 140° F. for the equivalent of five years domestic service, individual scale deposits varied from ⅛ to ¼ in. This hard porous scale was deposited on the bottom surface of the tank and in the circulator. The deposit in the circulator at the left of Fig. 2 was obtained after five years of domestic service with the water temperature maintained at 140° F. The scale deposit on the right was formed after two years of domestic service with the outlet temperature at 175° F. An analysis of this scale showed that it consisted principally of calcium carbonate together with small amounts of calcium and magnesium sulphate. The water supply used may be classified as being moderately hard. The average hardness expressed in terms of calcium carbonate is 330 parts per million or 19 grains per U. S. gallon.

Recently a great deal of emphasis has been placed on the use of water temperatures between 160° and 180° F. for sterilization purposes in commercial kitchens and restaurants. An added advantage of high temperatures lies in the fact that the dishes when sprayed do not require any toweling but will dry from the heat stored in them. Under such service conditions it is expected that scale formation in commercial heaters will be much more severe than for domestic heater installations. Some tests were performed upon the continuous flow type gas water heater which is designed to supply large quantities of high temperature water. The water passes through a continuous copper coil from the inlet to the outlet of the heater. In this design the water velocity would naturally be quite high, and it was assumed that the high velocity combined with a smooth interior surface of the copper coil might reduce scale formation to a negligible quantity. However, the result of the tests showed that scale formation definitely took place in a relatively short time. A total of 62,000 gals. of 180° F. water were supplied from the heater before the scale formation interfered with its operation. Assuming a restaurant used an average of 300 gals. a day, this would represent a service time of seven months. Under laboratory conditions a total water pressure of 80 lbs. was available, and the heater was operated until scale restrictions prevented obtaining the manufacturer's rated hot water output.

In the first series of tests scale formation in the water control valve which was located in the hot water line gave difficulty in maintaining a fixed temperature of 180° F. However, another series in which the control valve was placed in the cold water line was more successful, since it was possible to control water temperature between 175° and 185° F. After the test the various parts of the heater were dismantled and the scale removed in order to determine its distribution in various parts of the heater. It is interesting to note in connection with this water temperature phenomena that no scale was found in the lower finned element which contained the thermostat rod. This was to be expected since the heater was so designed that the water temperature at this point was not over 110° F. The most concentrated scale deposit was found in the combustion chamber coil which consisted of a continuous run of copper tube soldered to a conical-shaped combustion chamber.

Final Heating Zone

It should be noted that this was the final heating zone and that the highest temperature water existed in this section of the heater. A scale deposit was also found on the top heating element which is located above the burner and which received heating gases directly from the burner. Again in this case it was noted that the thickest scale deposit was found in that portion of the copper tubing carrying the highest temperature water. Table No. 1 shows the distribution of hard water scale deposit in various parts of the heater.

Again it was surprising to find that the thermal efficiency of the heater was not effected as greatly as one might suppose. As shown on the chart, Fig. 3, there was no appreciable decrease

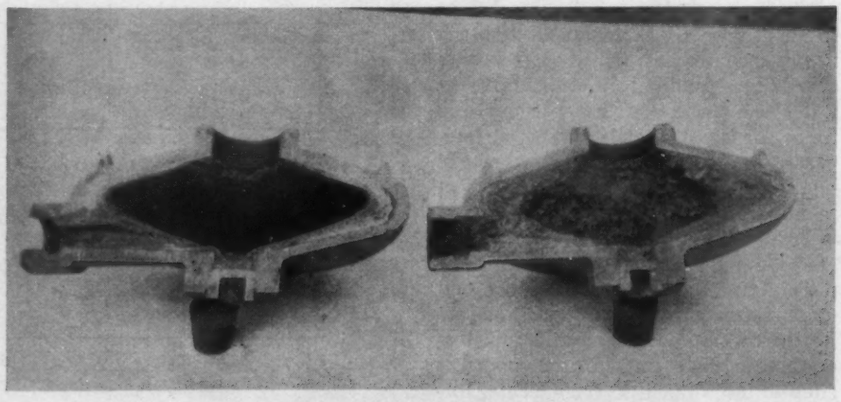


FIG. 2. Hard water scale deposits in a circulator.

in efficiency when 50,000 gals. of hot water had been supplied by the heater. When 60,000 gals. of water had been passed through the heater the thermal efficiency had decreased by 5 per cent.

From the above experiments and field experiences it can be seen that excessive scale formation can be avoided by using heaters equipped with water temperature controls and by setting the control at the lowest possible temperature which will give a satisfactory service. It can readily be seen that water heaters without temperature controls will supply water at unusually high temperatures and will thus increase the rate of scale formation in the heater. However, scale formation cannot be prevented entirely by controlling temperature.

The usual type of water softener consisting of a storage tank and a chamber for holding the reacting chemical will successfully prevent scale formation when of adequate capacity and when cared for according to the manufacturer's instructions. This type of water softener is often called the zeolite or the exchange type softener since it substitutes sodium ions in place of calcium ions in the water supply. Thus a hard water containing temporary hardness in the form of calcium bicarbonate is converted into sodium bicarbonate by the action of the softener. Sodium bicarbonate is a stable salt and is not broken down by the action of heat.

Heat Action Causes Deposit

At temperatures below the boiling point, temporary hardness in the form of calcium bicarbonate is the component of the water supply which gives difficulty from scale formation. Under the action of heat calcium bicarbonate is broken down into calcium carbonate which deposits on the heating surface. An analysis of the scale formed in our tests at 180° F. and also at 140° F. showed that it consisted principally of calcium carbonate together with small parts of calcium and magnesium sulphate. The analysis of the scale formed compared with that of the water indicated that temporary hardness in the water supply is the source of practically all of the scale when operating below the boiling point.

A new method of preventing scale formation by mixing small proportions of a chemical compound with the water supply shows great promise from the viewpoint of developing a low cost softener requiring a minimum of attention when properly designed. It has been shown that the addition of two parts per million of hexametaphosphate added to the water supply will prevent precipitation when the water is heated to 176° F. for one hour.* This method of preventing precipitation is called "threshold treatment" rather than softening, since these small quantities of the hexametaphosphate do not soften the water but only form enough of a complexion with calcium to prevent precipitation. Another property of sodium hexametaphosphate is also of value. If scale formation should take place due to neglect in replacing the material in the feeder, the scale formed would be slowly dissolved when the solution was replaced.

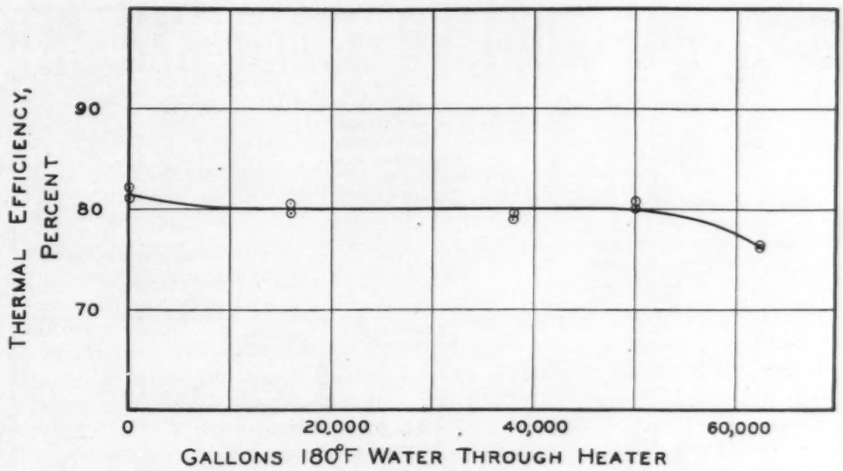


FIG. 3. Thermal efficiency of heater during scale formation test.

In order to apply this discovery to commercial water heaters, it is necessary to design a feeder in such a manner that quantities of the order of five parts per million will be continuously and effectively fed into the water supply. When considering water usage in commercial kitchens it can be seen that the storage requirements for the hexametaphosphate solution are at a minimum. Taking a typical example of a restaurant using 9000 gals. of 180° F. water per month, it can be seen that only four-tenths of a pound of sodium hexametaphosphate would be required during a one-month period.

If sodium hexametaphosphate is already used for softening purposes in the commercial kitchen it would be desirable to feed this chemical into the water supply just ahead of the water heater. The concentrations required for softening the water are 1.5 to 2.5 lbs. per 100 gals. of water. This quantity is far in excess of the amount required to prevent scale formation in the heater and, hence, no scale difficulty should arise. These larger quantities soften the water completely from the viewpoint of soap usage, since no insoluble calcium soap precipitates are formed.

If attempts are made to reduce the feeding rate to such small quantities as five parts per million, a wick type feeder would be one possible design. The hexametaphosphates will dissolve in water up to 70 per cent by weight. Thus a concentrated solution of sodium hexametaphosphate could be stored in a small container and fed into the storage tank or water supply line as shown in Fig. 4. These concentrated solutions are corrosive to iron and steel, hence the container and fittings should be made of corrosion-resisting materials. The glass container shown in the sketch would be designed to withstand normal water supply pressures and would have the advantage of giving a visible indication when replacement of the water softener was necessary. The rate of diffusion of the concentrated solution into the water supply could be regulated by varying the length of the wick immersed in the supply pipe.

Designing a Feeder

The principle of osmosis could also be employed in designing a small feeder. As shown in Fig. 4, a saturated solution would be held in a porous container and the water supply allowed to pass around the outside of this container. The rate of diffusion through the porous membrane would regulate the rate of feed. In this design provision should be made for cleaning the container since dirt, rust, and organic growths would tend to clog the pores.

The by-pass type feeder is already in common use where it is necessary to treat boiler feed waters. The type of feeder shown is most suitable for briquette or lump material which is generally used for boiler feed treatment. Control is obtained by means of a valve placed in the main water supply line and an auxiliary small needle

*Industrial and Engineering Chemistry. Vol. 31, p. 51. Jan. 1939.

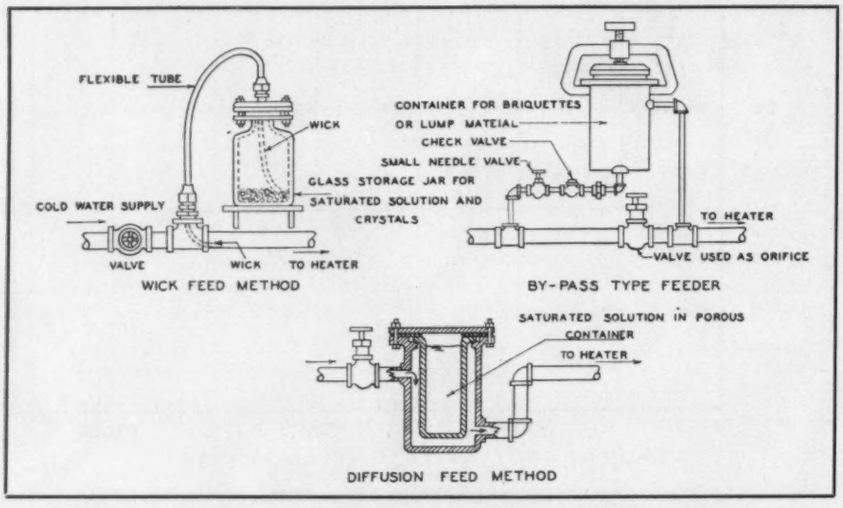


FIG. 4. Feeder designs for threshold treatment to prevent scale formation.

valve in the by-pass line. The main valve serves as an orifice and gives sufficient pressure drop to cause a slow feed of water through the by-pass arrangement.

Metaphosphates having relatively low solubility have been developed by the Calgon, Inc. for the purpose of facilitating the proportioning of metaphosphates for threshold treatment. One pound of this material placed directly in the water line will dissolve at the rate of one part per million when the flow is 1 gal. per minute. In other words, if a continuous flow type gas water heater having a rating of 3 gals. per minute is in service and a feed of three parts per million is desired, 9 lbs. of this material should be placed in the line. A suitable container for this application could be made up from a length of pipe or an ordinary drum trap fitted with appropriate screens of corrosion-resisting material.

In conclusion it may be said that all of the test work done indicates that water temperature is the principle factor causing scale formation in water heaters. It is apparent that more extensive use of water softeners or other methods of preventing scale formation will be required on commercial installations, especially when high temperature water is being served.

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Bureau of Mines Releases Dates for Final Inspection of Coatings Installed in 1930

FINAL inspections of the pipe-line coatings installed in 1930 for the tests undertaken jointly by manufacturers of protective coatings, the American Petroleum Institute, and the National Bureau of Standards will be made in the spring and summer of 1940 under the supervision of the Bureau of Standards, it has been announced by K. H. Logan, chief of the Underground Corrosion Section. A report on this work will be presented by the Bureau at the annual meeting of the Institute in 1940.

The following tests will be made as on former inspections: (1) soil resistivity measurements; (2) current on the working lines; (3) pattern tests for the location of pinholes; (4) coating resistance (electrical); (5) inspection of coatings, probably in accordance with the UPPI Code for inspections; (6) measurements of pit depths on bare and coated specimens of pipe.

At each of 13 test sites there remain 14 coatings on each of two 12-ft. sections of working pipe line. At 15 test sites there are approximately 46 varieties of coatings applied to 2-ft. sections of 3-in. pipe. There are also several sections of uncoated line and 3-in. pipe at each test site.

Following is a tentative schedule for the inspections. Because of weather and labor conditions it may not be practicable to adhere strictly to the schedule, and it is impracticable to determine far in advance the exact day on which any particular coating will be exposed.

Tentative schedule for inspections of pipe coatings is as follows:

California — Long Beach, March 4 to 12; Cholame Flats, March 14 to 20; Mendota, March 22 to 25.

Texas — Temple, April 2 to 10; League City, April 12 to 20; El Vista, April 22 to 30; Spindle Top, May 1 to 9.

Louisiana — Bunkie, May 11 to 21.

Oklahoma — Council Hill, May 24 to June 1; Skiatook, June 3 to 11.

Kansas — Arkansas City, June 13 to 21; Caney, June 23 to July 2.

Illinois — Mt. Auburn, July 5 to 13.

Indiana — Preble, July 15 to 23.

Pennsylvania — Chambersburg, July 26 to August 3.

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Charles B. Babcock, Pacific Coast Gas Leader, Passes

CHARLES BUCKLEY BABCOCK, president of C. B. Babcock Co., prominent wholesale dealers in gas appliances, died early Sunday morning, January 7, at St. Mary's Hospital, San Francisco. He was 56 years of age.

C. B. BABCOCK

Mr. Babcock's illness dates from October last, when his physicians ordered him to the hospital for rest and observation. His illness was later complicated by pneumonia, from which he could not recover.

Mr. Babcock, while a resident of San Francisco, had long been prominent, not only in local business circles, but throughout the Pacific Coast as the representative of several large eastern appliance factories. Among others, he represented the General Gas Light Co., of Kalamazoo, Mich.; the Eclipse Fuel Engineering Co., of Rockford, Ill., and the Johnston Gas Appliance Co., of Cedar Rapids, Iowa. He was a pioneer in the gas heating business, having been the manufacturer of one of the first gas furnaces offered in the west.

Mr. Babcock was born in Utica, N. Y., July 10, 1883. He came west as a very young man and after spending some time in Spokane, Wash., and Portland, Ore., founded the C. B. Babcock Co. in San Francisco in 1911. He soon became one of the leaders of his industry, serving as president of the Pacific Coast Gas Association in 1917. He continued as a leader of this industry group until the day of his death.

Mr. Babcock made his home at 140 St. Elmo Street, San Francisco. He is survived by his wife, Bertha M. Babcock; a son, Charles E. Babcock, and a daughter, Mildred Veale, of Riverside, Calif. The widow and son will carry on the business.

THE GAS RANGE OUTLOOK FOR 1940

By W. E. DERWENT

Chairman, Domestic Range Division, Association of Gas Appliance and Equipment Manufacturers

ONE of the greatest sales and profit opportunities in the home appliance field is today presented to the retailer of modern gas ranges in a huge replacement market which is ripe and ready for aggressive sales efforts.

Here's the background: There are 16,000,000 gas range users, of which over 8,000,000 still cook with ranges lacking oven heat control or even adequate insulation. This means that more than one out of every two homes on the gas mains is a prospect for a modern gas range! Furthermore, of these obsolete ranges, some 5,000,000 are more than 10 years old, which makes them virtual relics as compared to the performance and convenience offered by the modern gas range.

W. E. DERWENT

As proof of the sales potentialities of this great backlog of accrued obsolescence — this vast replacement market — here is a record of the sales of modern gas ranges over the years 1937-1938-1939 (the figure for 1939 is based on 10 months' totals, with November and December estimated according to the 10 months' average per centage increase of 1939 over 1938):

1937	1,447,800
1938	1,024,900
1939	1,350,000

Sales for 1939 represent, according to the above figures, an increase of nearly 32% over 1938 and, based on present estimates, sales of modern gas ranges for 1940 should total 1,500,000. It is interesting to note that gas range manufacturers' records show that between 60% and 75% of this profitable business is being secured by dealers.

Changing Methods

Startling changes have occurred in methods of modern gas range merchandising. Previously gas ranges were sold on the basis of price, construction, appearance — with little or no emphasis being placed on cooking performance. While appearance is still a good selling appeal, gas range merchandising has progressed from the nut-and-bolt era to the stage where the homemaker's interests are being given prime consideration from the standpoint of labor saving, time releasing, economical and controlled cookery. In this respect, gas ranges are now being sold to the homemaker in the same specialized manner as refrigeration, water heaters, and house heating, whose promotional methods are based on product service rather than the construction of the appliance.

The selling of a modern gas range by romancing the full service convinces the homemaker that "cooking is a gay adventure," that she is transformed "from a kitchen drudge to a Cinderella," and that she can produce with ease and comfort a breakfast for two or a dinner for 12.

Thus, in promoting gas ranges on the basis of what they will do for the homemaker instead of on the basis of the old-fashioned nut-and-bolt story with a low price appeal, cut price selling is losing its effectiveness. Gas ranges have been promoted at cut prices so long that the customer is beginning to disbelieve all claims for sales or special reductions. The consumer, in other words, is getting so fed up with it all that price is no longer an important sales appeal.

In a recent survey which was conducted along the Gallup poll lines, it was found that such features as full automatic lighting, oven heat control and other time-saving conveniences meant more to the homemaker than price. Certainly time saving and food saving features mean more to even the lower income group, who are far in the majority, than such features mean to Mrs. Gotrocks in the upper income who has two maids and a butler.

The American public can be made to realize and be sold on the idea that *purchase price and cost of ownership are not the same thing!* That is what is happening in gas range selling, just as it happened in other specialty selling fields. Why have 14,000,000 homemakers paid an average price of $185.00 each for automatic refrigerators to replace $35.00 ice boxes? If price and cost are the same, why have millions of American homemakers paid $89.00 for washing machines to replace 89c washboards and tubs; why have they paid $69.00 for vacuum cleaners to replace 69c brooms?

There has been enough evidence collected to fill a moving van to prove that when Mrs. Homemaker walks into your store with a good credit rating and an itch to own a new gas range, the thing which interests her more than price is the performance and service she will receive from the range. If one could place dictaphones on the bridge tables of America, he would find that women are talking more and more about "waterless cooking," the preservation of minerals and vitamins, low temperature cookery of meat to cut shrinkage, non-smoking broilers, cooler kitchens, everything but price or something "cheap."

Nation-wide results show that since the launching of the CP gas range program, more sales of the better grade gas ranges have been made. In other words, there has been a decided increase in unit sales of the upper bracket lines, which has been confirmed by leading range manufacturers who state that over 60% of all gas range sales now represent the better grade appliances. Since the inauguration of the CP program, and as a result of its attendant publicity for automatic gas cooking, the percentage of oven heat control range sales to total gas range sales has increased from 77% in 1938 to 83% in 1939.

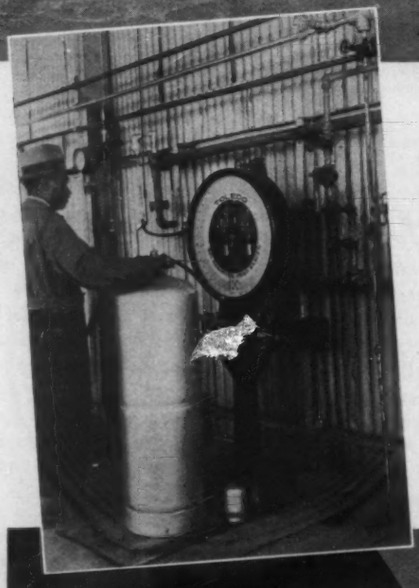
A Timely Program

The conception of the program was most timely. As every businessman knows, there is in this country a rapidly growing consumer movement. It is sweeping the country by storm and is being led by women's organizations, educators, economists and civic groups who are demanding that industry label merchandise with a guide or a trademark. The consumer wants proof before she buys that the elements of quality are contained in a product. Therefore, when she sees the CP symbol on a modern gas range, whatever its make, she is assured that the range so labeled has built into it 22 of the best features of all modern gas ranges.

Today, more than 20 of the nation's leading gas range manufacturers are backing the CP program and offering over 400 different models, types, or brands which have received laboratory approval as having met the CP requirements.

Modern gas cooking is on the march! National promotion in 1940 of quality gas ranges through 95,765,000 national advertising messages by the American Gas Association in consumer publications, and two major campaigns to be issued by the A.G.A.E.M. in coming months, cannot help but make 1940 a "Parade to Profits" with modern gas range sales.

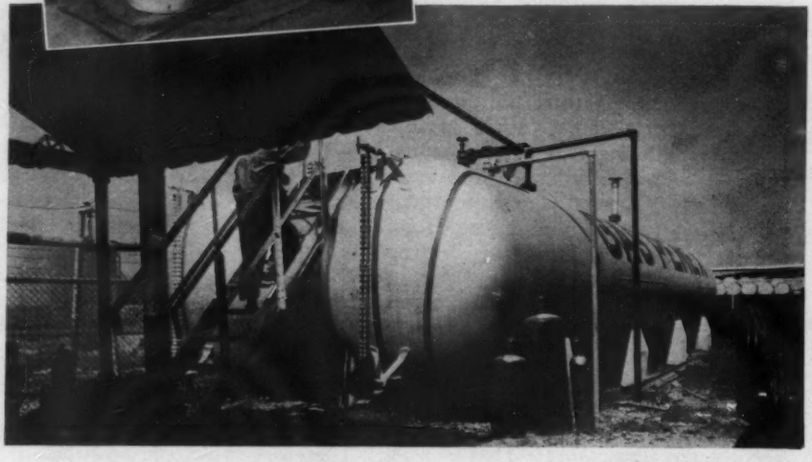
Gas Service



ABOVE:
Bulk and filling plant of Petroleos Mexicanos, with 1721 cylinders to be filled with liquefied petroleum gas.

AT LEFT:
The filling and weighing operation at the plant.

BELOW:
Two 10,000-gal. bulk tanks of "Pemex-Gas."



WHEN one considers that Mexico City has a population twice that of Cincinnati and no gas plant, it is easy to visualize the vast possibilities of liquefied petroleum gas service now existing in one of the world's most colorful and ideally situated metropolitan areas.

Throughout the entire Republic of Mexico there are at present only 8000 consumers of liquefied petroleum gas. Two-thirds of these are in Mexico City proper and are being served by three companies. The largest of these is Petroleos Mexicanos, a government-owned project which is an outgrowth of the gas department of the expropriated El Aquila, a subsidiary of Shell Petroleum Corp. The second distributor, Cia Distribuidora de Gas, owned by Daniel Vela, markets a product called "Vela-Gas." The third is the Hidro Gas Co., which serves about 500-800 customers.

Once both Mexico City and Guadalajara, the second city in the Republic (200,000 population) had gas plants with regular piped service. In 1915 the service was discontinued when the revolutionary armies captured the plants, shot the holders full of bullet holes and melted all the available metal into bullets. Ten years later, in 1925, the owners of the Mexico City plant made an effort to re-establish its service but the distribution lines and other facilities were in such bad condition that the project was abandoned. It was not until the early 1930's that the present liquefied

LEFT: Interior of the main gas appliance "exhibition salon" of Comisionistas de Chihuahua, S. A., Mexico.

AT RIGHT: The Company's business office and display room in the State of Chihuahua. Guillermo Santillana is manager of the butane gas department.

AT LEFT: A typical home installation on the patio of a Mexico City residence.

SOUTH OF THE BORDER

By JAY JENKINS

petroleum distributors gained a foothold in the market.

The Petroleos Mexicanos serves more than 4000 consumers with its product, "Pemex-Gas," which is a mixture of 60 per cent butane and 40 per cent propane. Due to the high elevation of Mexico City (7400 ft.) the effective B.t.u. per cu. ft. as measured by displacement meters of this 60-40 mixture is 2390, as opposed to the normal heating value of 3000 B.t.u. as measured under the standard sea level barometric pressure of 760 millimeters.

The "Pemex-Gas" department of this government-owned utility is under the able direction of Claude Hojel, a British subject whose background well qualifies him as a leader in the large development program now under way. Mr. Hojel was born in Mexico City, educated in England. During most of his life he has been in close contact with public service work in Mexico, as his father for more than 25 years was in charge of the Belgium-English owned hydro-electric properties which now distribute electricity in the city.

Dual Cylinder Installation

This company uses a dual cylinder installation placed on the customer's premises in a steel cabinet which is manufactured in Mexico City. All other equipment is bought from the United States. The cylinders are imported from the Pressed Steel Tank Co., of Milwaukee; the valves and control equipment from Bastian-Blessing Co., of Chicago. All installations are of equipment which conforms with I.C.C. specifications in the United States and meets Underwriters Laboratories' requirements.

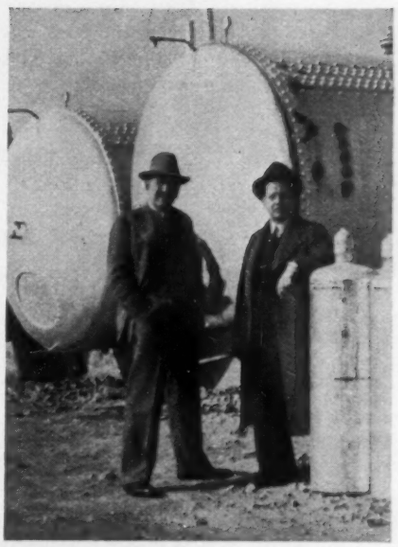
The fuel is transported several hundred miles to Mexico City from the company's 18,000-gal. bulk station and cylinder filling plant at Tampico. Four special propane railroad tank cars recently purchased by the company are used for this purpose. The bulk station and cylinder filling plant serving Mexico City have a present capacity of 20,000 gals., consisting of two 10,000-gal. tanks manufactured by the Hamler Boiler & Tank Co. of Chicago. The company plans an additional 18,000-gal. tank to be installed within a few months. Bottles are filled at this plant to serve Mexico City, the City of Pueblo and adjacent territories within an 80-mile radius, the fuel being transported by truck and rail. At the present time the company is planning further bulk station expansion, and is soon to install an 18,000-gal. bulk station and bottle filling plant at Torreon, which will also serve the adjacent communities of Chihuahua City and Saltillo. A similar installation is planned for Guadalajara where bottles will be filled to supply Mazatlan (population 25,000), Tequila, and other surrounding communities.

The advent of the modern bulk station has eliminated the transportation difficulties which hampered the company's service prior to 1934. During 1932 and for more than two years thereafter the cylinders were shipped by rail to Veracruz for refilling—an overnight trip by train.

At Veracruz the cylinders were transferred to boats and taken to the mouth of the Coatzacoalcos River. At this point the cylinders were loaded on launches and sent up the River Agua Dulce from where they were taken to the field to be filled with natural gas at the well-head. The cylinders were then returned over the same route to Mexico City. This expensive and inconvenient method employed prior to 1934 is perhaps one of the principal reasons why many companies were unsuccessful and why development of this market has progressed so slowly.

The company does no advertising or sales promotion work. The only dealer cooperation given is the supplying of a cylinder of gas for demonstration purposes. The company emplovs four salesmen whose duties are devoted entirely to service and contract adjustments. Gas appliances are demonstrated and sold with liquefied petroleum gas by eight or 10 leading stores in Mexico City. About 85 per cent of the gas served is used for cooking, 10 per cent for industrial purposes and approximately 5 per cent for hot water service. The most popular hot water heater is an instantaneous type manufactured in Germanv. The present war conditions in Germany have stopped importation.

All equipment is owned by the distributing companies and loaned to the consumer, who is billed for the cost of the gas at the time each cyinder is ordered. A 95-lb. cylinder sells for $3.32 American. For new installations for new homes where piping is necessary, an independent plumber does the work at the expense of the consumer. The distributing company service man makes the test and turn-on for each new consumer.



Jay Jenkins and Daniel Vela beside storage tanks and bottles at the plant of Cia Distribuidora de Gas, Mexico City.

Cylinders of liquefield petroleum gas are available at all Petroleos Mexicanos gasoline service stations throughout Mexico. A great number of small industrial consumers use batteries of cylinders.

Up to this time there has been no development in the conversion of automotive equipment to butane. However, it is understood that several companies operating fleets of trucks plan to change over within the near future.

The Price, 40 Centavos

"Pemex-Gas" in cylinders sells at 40 centavos (about 7 cents American) per Kilo, a Kilo being equal to 2.2 lbs. The centavo at this writing is worth approximately one-sixth of an American penny.

The second distributor in Mexico City, the independent Cia Distribuidora de Gas, sells "Vela-Gas" in cylinders at 55 centavos per Kilo. The company's cylinder-filling plant in Mexico

City has a present capacity of 50,000 gals. Fuel is purchased in tank cars from the Phillips Petroleum Co. in the United States.

There are several reasons for the rapid expansion of liquefield petroleum gas service in the Republic of Mexico. Not the least of these is the fact that the gas rates in Mexico City are approximately half those of the electric utility. However, the cost element is only one reason why gas is forging ahead of electric service. Interruption of electric service (not an unusual occurrence) is the major reason for the growing favor of gas service, which is taxing the capacities of all distributors.

There are several reasons for this inadequate electric service. The present facilities of the electric company have been taxed for many years, and with the present Federal Administration in office, the company is reluctant to spend money for building greater capacities. Furthermore, the company has watched for the past several years the Communistic actions of the government in confiscating haciendas and dividing them with the peons. They likewise have witnessed the expropriation of the American oil company properties. Certainly any American business man in this position would stop, look, and listen, and the Mexicans likewise are more than hesitant to invest additional capital in developing the power facilities. Still another factor was the strike of the electric workers in July of 1936.

Another primary reason for the rapid expansion of gas service in Mexico City is the country's excellent climate. The temperatures, being somewhat similar to the more elevated portions of Arizona, make the country an ideal market for spot heating. The days are exceptionally warm and sunny; the nights contrastingly cold. Many times during January and February the mercury drops during the night to the freezing point. Yet, the distributing companies claim that less than one per cent of their load is used for heating purposes. The reason for this is that every home in Mexico, from the humblest to the most pretentious, is built with one or more patios. The larger homes even have patios for their servants. When one gets chilly during the day, he warms himself by spending a few minutes on the patio. During the night an extra blanket solves the heating problem. In the larger homes a bit of charcoal (the universal fuel) burns in the fire-place.

Future Aspects

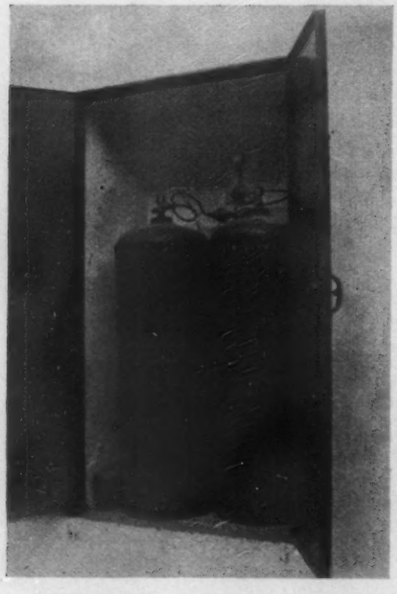
Although the development of space heating will take considerable promotion and advertising it presents one of the rosiest aspects of the future gas market in Mexico. At the present time, however, both of the local distributing companies are too busy meeting the demand for cooking service to consider seriously the building of a heating load.

At this writing there are no laws or safety requirements for liquefied petroleum gas service in the Republic. Poor equipment and careless installations have resulted in several fires. This condition has prompted the government to consider adopting regulations covering the installation of this fuel throughout the Republic. A committee has recently been formed to prepare a set of regulations to apply and these are now in the preliminary stages. These are expected to follow the laws of the State of Texas.

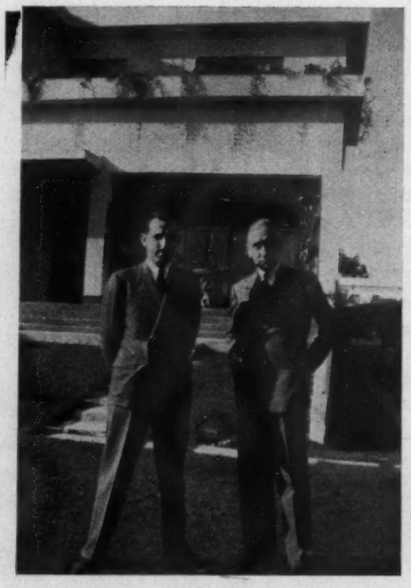
Important in this work and in his assistance to the government is Othan G. Neumann, an American citizen born in Mexico. Mr. Neumann's father was American consul in Northern Mexico for a great number of years — up until his resignation at the end of the World War No. 1. With a background of 10 years in the States with the Oil Well Supply Co., Mr. Neumann returned to Mexico City four years ago to act as representative for United States manufacturers who specialize in liquefied petroleum gas equipment and these connections have proved of great assistance to him in his work with the Mexican government in outlining a code of requirements. Mr. Neumann's company represents the Bastian-Blessing Co. of Chicago, Pressed Steel Tank Co. of Milwaukee, and the Hamler Boiler & Tank Co. of Chicago.

Liquefied petroleum gas sales during 1939 in Mexico City increased 60 per cent in gallonage over 1938, while at the same time the number of consumers was up 130 per cent. Distributors in other sections of Mexico are doing equally well. Important among these is Thermo-Gas Mercantil Distribuidora, S. A., of Monterrey, which serves only the suburbs and small surrounding towns with bottled gas. This company is managed by P. Barragan, and has recently acquired a 1200-gal. tank truck for deliveries. The city of Monterrey, itself, has had natural gas service for many years, supplied by a pipe line from Texas. In Chihuahua City, the Comisionistas de Chihuahua, an independent company, is developing the market in this area. However, as stated above, the Petroleos Mexicanos also plans to enter this market.

This is election year in Mexico. Unless there is a change in the political situation, giving the Republic a more conservative government, it will be up to the government itself to develop the liquefied petroleum gas market, for it is apparent after the recent expropriation of the oil industry that it will be many years before outside capital will have the courage to come into Mexico to aid the country in developing its natural resources. The conservative element in Mexico has not forgotten that the peso is worth today only one-half in American money of what it was when Cardenas took office.



New homes, usually constructed of stucco over brick, have recesses built into the outside wall for gas cylinders.



C. R. Hojel, manager of Pemex-Gas Co. in Mexico City, and O. Neumann, manufacturer's representative.

At Tookes Landing the 8-in. Bistineau-Koran line, coated and wrapped, is ready to be pushed across Lake Bistineau.

By R. H. FEILD

and

J. D. ROSS*

UNITED GAS PIPE LINE COMPANY'S

Laying a bent section on United Gas Pipe Line Co.'s 20-in. main line between Koran and Minden, La.

SLIGO-BISTINEAU-MINDEN PROJECT

UNITED Gas Pipe Line Co., Houston, Texas, has completed several pipe lines from Sligo, Bistineau, and Sibley gas fields to the Arkansas-Louisiana Gas Co.'s 20-in. main line near Minden, to serve as an outlet for the gas from these reserves to augment the supply to southeastern Louisiana, Mississippi, Alabama, and Florida.

Before the size and route of each line were determined, it was necessary to estimate the reserve of each field, the number of wells to be drilled, the daily allowable from each well and the life of each field.

Routes for lines extending 7.43 miles each out of the Sligo Field, and 4.55 miles northwest out of the Lake Bistineau Field, respectively, were surveyed to meet near Koran, from which point a survey was made for the 20-in. line projected to extend from Koran northeast 17.8 miles to intersect Arkansas-Louisiana Gas Co.'s 20-in. line near Minden, La. An additional survey was made for a line 1 8/10 miles long from the Sibley Field, northwest, to intersect our Koran-Minden 20-in. line.

After a careful study of the loads to be carried, a pipe line system was designed whereby large quantities of gas could leave the gas field at a pressure of 800 lbs. per sq. in., and arrive at the Arkansas-Louisiana Gas Co.'s 20-in. main line with a pressure of 450 lbs. per sq. in. From this point the Arkansas-Louisiana company transports the gas for us and makes delivery to our lines at the point of connection near Sterlington, La.

The main line from Sligo field to the beginning of our 20-in. line consists of 7.43 miles of 14-in. seamless pipe, solid electric welded, coated with one coat of coal-tar primer and one coat of coal-tar pipe line enamel. At present this line discharges into a separator, located at the beginning of our 20-in. line, and then is measured into the Arkansas-Louisiana 20-in. main line near Minden.

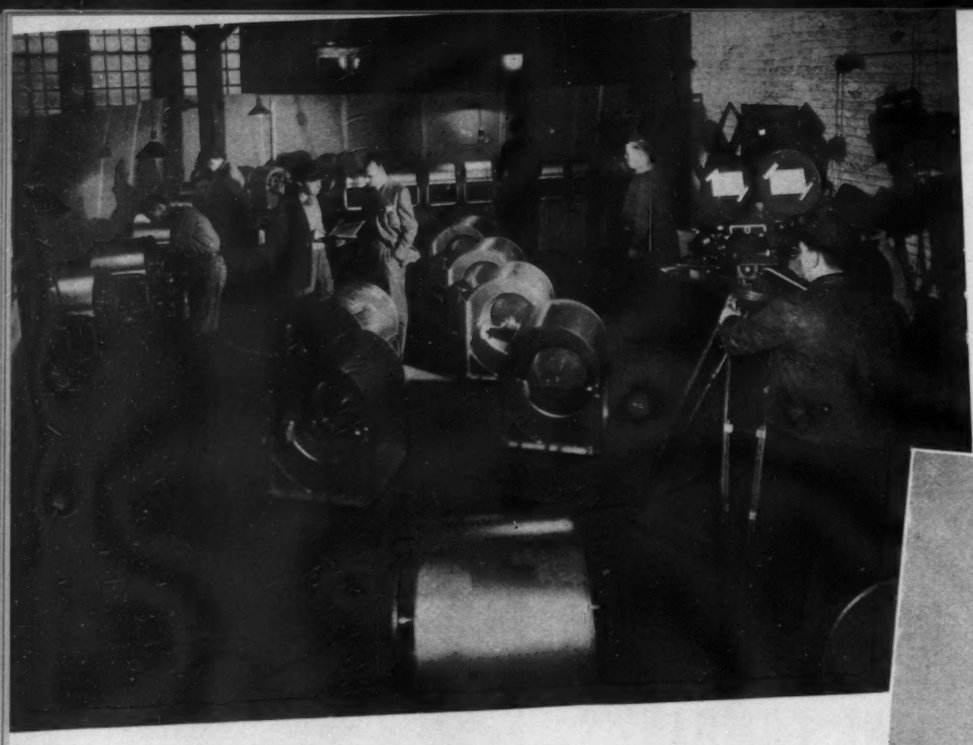
The Bistineau gas field is located on the east side of Lake Bistineau. This made it necessary to lay the new 8-in. field gathering line across 3300 ft. of the lake. This lake is a state game and fish preserve, also a navigable stream. The company agreed to construct and maintain this line so as not to interfere with navigation on the lake by motor boat, house boat, and other small craft, and so as not to contaminate, pollute, or otherwise injure or damage the waters of the lake. To do this a solid electric welded 8-in. pipe, coated with one coat of coal-tar primer, two coats of coal-tar pipe line enamel, asbestos wrapper and wood lath, was made up on the west bank of the lake and pushed across with the front end suspended on a barge. It was not necessary to use river weights because this pipe weighs 38.42 lbs. per ft. with a displacement of only 25 lbs. per ft. The balance of the line is 8-in. pipe, coated with one coat of coal-tar primer and one coat of coal-tar pipe line enamel. At present this line discharges into two separators located at Koran.

Since the 20-in. main line from Koran to Minden passes near the Sibley gas field, it was necessary to lay only 1.8 miles of 4-in. — 10.79 lb. — lap-weld pipe, coated with one coat of coal-tar primer and one coat of coal-tar enamel.

This 20-in. main line extends from Koran across the northern end of Lake Bistineau, to the Arkansas-Louisiana Gas Co.'s 20-in. Waskom-Sterlington main line, four miles east of Minden, La.

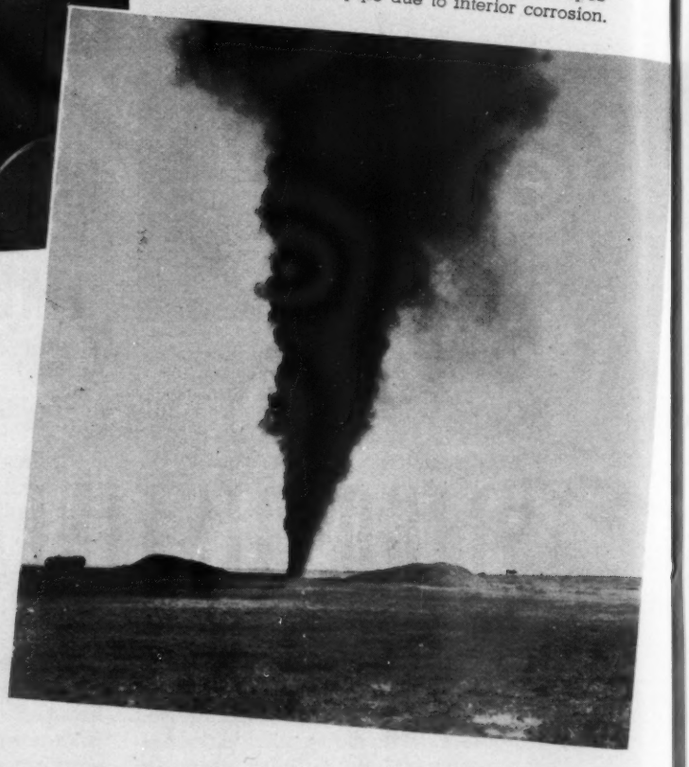
The major portion of this line consists of 20-in. seamless pipe, two electric welds, one style 38 Dresser coupling, coated with one coat of coal-tar primer and one coat of coal-tar pipe line enamel. However, 20-in. seamless

*Excerpts from an article published in the *United Gas Log*, United Gas Pipe Line Co., Houston, Texas.



HOLLYWOOD CAMERAMEN took possession of the plant (left) of the L. J. Mueller Furnace Co., Milwaukee, on Dec. 11, when production began on the new sound motion picture entitled, "The Hard Way." This movie depicts the progress of the company since its inception in 1857 and portrays what goes on in the Mueller plant, forming the spearhead of the 1940 advertising campaign. On the set are H. P. Mueller, company president, and R. W. DesJardins, advertising department.

NOT A PHOTOGRAPH of a midwest cyclone (below), but one taken at the direction of F. F. Doyle, manager of Natural Gas Division, while purging a Pacific Gas and Electric Co.'s transmission line in northern California The dirt removed was deposited on walls of the pipe due to interior corrosion.



GAS Camera

ABOVE: This Christmas tree attracted thousands of visitors to the lawn of Maurice White, manager of the Mobile Gas Service Corp., in Mobile, Ala. It was constructed of 2- and 1½-in. pipe, with ¾-in. pipe as burners and air adjustments to permit color changes. The tree was covered with asbestos and fire-proof tinsel.

CLOUD EFFECTS (below) prevent seeing the trailer wires which are carrying the "Best by Test — Gas Cookery" sign used by J. Calhoun Smith, sales manager of the Consumers Gas Co., Reading, Pa., in his advertising last fall. The photo is by his son, J. C. Smith, Jr.

pipe was used under the Illinois Central Railroad, Clarks Bayou Crossing and Lake Bistineau Crossing.

Many difficulties were encountered during the construction of this line. During the present low-water of Lake Bistineau, 900 ft. of 20-in. pipe had to be made up on the east bank and pushed across the lake. This pipe has a displacement of 157-lb. per ft., therefore, it was necessary to use 1000-lb. river weights every 10 ft. with a special safety sleeve over each weld. This pipe was coated with one coat of coal-tar primer, two coats of coal-tar enamel, asbestos wrapper and wood lath. To get the pipe on the bottom of the lake it was necessary to use a drag line to excavate the steep bank on the west side of the channel. One thousand nine hundred feet of this line on the west side of the lake were laid through a swamp, or overflow. It was necessary to anchor this portion of line with heavy anchors to keep the pipe from floating out of the ditch. The accompanying photographs show how the ditching machine bogged down and how rains filled the ditch with water. River weights and anchors were also installed across Clarks Bayou and several other swamps.

One of the three railroad crossings required 107 ft. of 24-in. casing. The railroad fill was approximately 20 ft. high and it was necessary to bore under this fill. Rains caused this bore to cave-in.

Pressure Raised

In order to make delivery from the fields at a pressure sufficient to feed against the anticipated peak operating pressure of 450 lbs. in the Arkansas-Louisiana line, it was necessary that all gathering line equipment in connection with such delivery be of 800 lbs. working pressure. Consequently the connections on 14 wells in Sligo, which wells have a total potential volume of 124,228 M c.f. per day, were converted to the higher pressure equipment. The original 500 lbs. working pressure equipment connected to each well was dismantled and new 800 lbs. working pressure equipment installed. The wells in the other two fields had not been previously connected to our pipe line system and the higher working pressure equipment was installed at the time the "tie-in" was made to this system.

This work was begun by company forces on October 5, 1939, under the direction of the Shreveport District pipe line department.

In order to complete the work within the alloted time, it was necessary to organize three construction crews. These crews were assembled from the temporary employes available, who were already experienced in this type of work. They were under the supervision of E. A. Cason, of the Sarepta section. J. E. Thomas, of the Rodessa section, and J. F. Narramore, of the Shreveport section.

On November 21, 1939, this project was completed and ready for delivery of gas into the new system.

The check meter stations were installed by company employes. J. M. Steele, district measurement superintendent, was in close contact with this work from the assembly of material to the final checking of the meters.

The check meter stations were all completed by December 14, and the system made ready for purging and testing. Purging and testing operations were complicated by unusual problems. The lack of communication facilities along the new lines required an unusual amount of traveling and many extra miles were required to get around Lake Bistineau which is located in the center of this activity.

The first deliveries were made into this system on December 18, from the Sibley field, and the other two fields soon followed, with deliveries being made from all by December 27, 1939.

Southern Association To Hold 32nd Annual Convention at Hot Springs, Arkansas

THE 1940 convention of the Southern Gas Association, its 32nd annual meeting, will be held at Hot Springs National Park, Ark., February 12, 13 and 14, according to an announcement by S. L. Drumm, the association's secretary-treasurer. This is the first time a gas convention has ever, so far as is known, been held in a national Park. At Hot Springs, which is one of the most beautiful cities in the United States and which is particularly enjoyable from a climatic standpoint during February, there is golf the year round, and arrangements have been made for complimentary golf tickets for all members. Horseback riding and special auto tours have been arranged for the wives of the members and other ladies attending the meetings. Convention headquarters will be at the Arlington Hotel. The Southern-Southwestern Regional Gas Sales Conference is being held in conjunction with the association's meeting.

Sales, being the backbone of the gas business, will, as usual, be accentuated at these meetings. However, the more technical problems encountered in operating gas properties in the 13 southern states, comprising this association, will also be touched upon.

Governor Carl Bailey of Arkansas will address the opening meeting Monday morning, which will be presided over by President C. H. Zachry, Southern Union Gas Co. The gas sales conferences will begin at 2 p.m. Monday, and the program will be continued through Monday, Tuesday and Wednesday.

At the first general session, Vice President C. B. Wilson, Little Rock, Ark., will deliver the report of the Committee to Promote Business Progress, of which he is chairman. The Resi-

C. H. ZACHRY

C. B. WILSON

dential Gas Sales Conferences will be presided over by L. M. Taylor, chairman, and C. L. Osterberger. D. W. Reeves, chairman of the Industrial Gas Sales Committee, will preside at the industrial sessions, and Chairman Aaron Bush will lead the Technical Gas Sales Conferences. The home service program is in charge of Marion Dow, who will also preside at the home service round table the second afternoon.

The 1939 meeting of the Southern Gas Association was held on the steamship Rotterdam, sailing on a special cruise from New Orleans to Havana, an innovation in gas association meetings which was highly successful.

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Hope Natural Gas Co. Takes Over Reserve Gas Co.

The Public Utilities Commission of West Virginia has recently approved the merger of the Reserve Gas Co., Clarksburg, with the Hope Natural Gas Co., also of Clarksburg. The combined companies will operate under the name of the Hope Natural Gas Co.

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Celina, Ohio, Manager Dies

John William Sheets, 46, manager for the past three years of the Celina, Ohio, office of the West Ohio Gas Co., died recently of a heart attack. He had been with the company for five years.

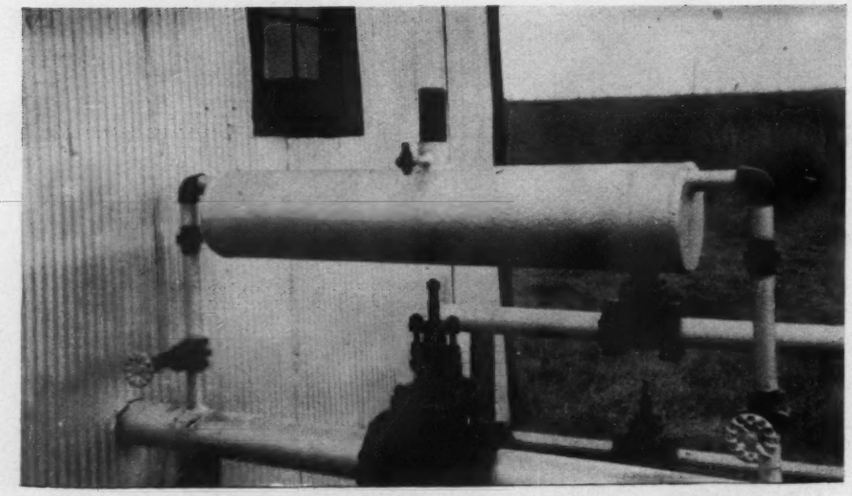

FIG. 1. Typical by-pass odorizer installed at Border Town Station to odorize the Herington, Kan., distribution system. Pentalarm is used by the Central West Utility Co.

By L. MILLIS

Division Manager, The Central West Utility Co., Herington, Kansas.

LOCATING PIPE LINE LEAKS with Odorant

THE Central West Utility Company, like many others, is confronted with the "Unaccounted For" gas problem. With each year adding age to our transmission and distribution lines, and the necessity of buying high-priced pipe line gas, we find that one of our greatest problems is leakage.

A few years ago our line-loss was averaging from 20% to 35% of all gas purchased and produced. A leakage "rodding" campaign was launched in order to reduce the loss in approximately 356 miles of equivalent 3 in. or a total of 315 miles of actual pipe.

Inasmuch as practically all of this pipe is buried, it was necessary to sink bar holes every 15 ft. and use the flash system to determine if leaks were present. Five men were employed for this work which required two months at an average cost of approximately $425 per month. Even with this large expense, no appreciable amount of leakage was accounted for.

It was therefore determined that the value of this type of leakage work was negligible and consequently a more satisfactory method was sought. An odorization method was developed which has enabled us to reduce this leak finding to an approximate $100 per month.

The odorizer was made according to our own design, and is of the "bypass" type, consisting merely of 4 or 5 ft. of 6-in. pipe with 1¼ in. inlet and outlet connections, installed over a main line gate valve. A typical assembly is shown in Fig. 1.

By placing "Pentalarm" liquid odorant in the container and "pinching" the main gate valve, so as to create a differential, a portion of the gas flow passes over the odorant. The amount of odorant to be used has been determined by experimentation and past experience, the amount varying on our type of odorizer with the flow of gas. The approximate amount used, however, is .015 lbs. per M c.f. or 15 lbs. per MM c.f. During warm weather we have been able to pass all gas through the odorizer, but in winter weather it is necessary to decrease the flow because of line drop, friction, etc. By using this method, we have been very successful in walking buried lines, and smelling the odor without rod holes or uncovering a useless amount of pipe. We have also been successful walking lines that are buried up to 5 and 6 ft. with 2 ft. of frozen ground. This has proven very beneficial to us, realizing that it is practically impossible to rod through frozen ground. Most of our lines are located in the shoulder of highways, thereby eliminating the possibilities of detecting leaks through the observation of vegetation. This is another reason which makes the use of odorant valuable to us.

It has recently been found that we get the same results from buried lines with the odorant diluted 50%, which, of course, means that heretofore we have been using too much odorant in our gas. This also cuts the price of odorant to one-half in accordance to amounts previously used.

It might be asked whether it is possible to locate very small leaks with the above described method. On several occasions we have detected leaks that were so small they could be located only with the use of soap suds after the pipe was exposed.

It has been found advisable to odorize lines only when necessary; and as soon as the line is walked, the odorizer is immediately shut off and repairs started. We are able to keep a close check on our different lines with the help of a highly efficient chart department, which furnishes the field offices with weekly line-loss reports of transmission lines, and monthly reports of distribution and transmission lines. When the leakage reports show that the loss is increasing on certain systems, they are immediately odorized and walked.

To prove the success of our process for the finding of leaks, we have been able to cut our leakage from 35% to a figure averaging from 6% to 12%.

With this new method we are now able to odorize and walk a distribution system consisting of 18 miles of pipe in one day with two men at a total cost of $16 which includes odorant, labor, truck expense, etc. By using the rod system it originally cost

$39.00 to check this same system for leaks, which also diverted the time of employes from routine duties for approximately four days. This, of course, caused important duties such as service work to be neglected until such a time when the campaign was over.

On all transmission lines an odorizer was placed as close as possible to the source of supply. In a few instances it was necessary to install gate valves at advantageous locations for these installations. We were also confronted with the fact that on extremely long transmission lines the odor diminished, which necessitated the installation of more than one odorizer on the same line. This was also necessary in some distribution systems, especially where the largest part of the gas load was going to a large industrial consumer. Having installed the first odorizers at the Town Border Stations, we derived better results by installing additional odorizers throughout the systems, preferably adjacent to low pressure district regulators where gate valves for bypassing were available.

When this intermittent odorizing was first put into effect, a considerable amount of complaint was received from our consumers. However, with educational literature and instructive conversations by the company personnel with consumers, we have eliminated the criticisms voiced by these consumers. At the same time, we have also helped them decrease their gas bills substantially, by eliminating house piping leaks. In other words, when odorant is detected by a housewife while cooking, she immediately realizes its source and does not become perturbed, unless its persistence indicates a leak or an improperly adjusted appliance.

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Defiance, Ohio, Expects Natural Gas By May

Natural gas will be available in Defiance, Ohio, around May 1, it was recently announced by S. S. Evans, manager of the Defiance division of the Toledo Edison Co., distributor of the gas. The changeover from manufactured to natural gas was expected last October, but has been delayed by negotiations, now completed, with the owners of the Texas-Detroit pipe line for permission to tap the line.

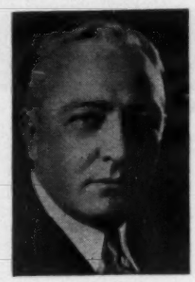
■ ■

Clifford E. Fox Dies

Clifford E. Fox, former superintendent of the Citizens Gas Co., of Hannibal, Mo., died on Jan. 16. He was 64 years old, and a Spanish-American war veteran. A native of Michigan, Mr. Fox started his career in the gas business with the Battle Creek Gas Co. In 1919 he became superintendent of the Benton Harbor-St. Joseph Gas and Fuel Co., and in 1926 took a similar position with the Citizens Gas Co., of Hannibal.

Pacific Coast Gas Association Plans Spring Sales Conference for February 12-14

DETAILS of a sales contest, sponsored by the Pacific Coast Gas Association as part of the Spring Sales Conference to be held in Los Angeles on February 12, 13 and 14, and outlined in the January, 1940, issue of *GAS*, were announced early last month in a bulletin issued by A. F. Rice, chairman of the Sales and Advertising Section of the Association. The idea back of contest, according to the chairman, is "to uncover latent sales talent, new ideas and promotional plans, and renew the attack upon old problems." It is, he says, "a quest for new blood and renewed enthusiasm."



A. F. RICE

Three grand prizes of $25 each and an undetermined number of $10 prizes are offered to the participants. These awards will be made by the Pacific Coast Gas Association. Any sales department employe below the rank of general executive of gas company members of the Association is eligible to compete. This includes those engaged in domestic, commercial, industrial or home service sales work.

Participants are required to prepare and submit a brief outline of a subject of their own choice which they think pertinent to any phase of sales activity in the domestic, commercial, industrial or home service field. Suggested subjects include: utility direct sales; dealer cooperation plans; solutions of sales problems; sales campaign plans; utility sales promotion plans; home service sales ideas; new, novel or unique ideas; statement of problems as yet unsolved.

The form the outline should take is as follows: (a) the title; (b) a paragraph, about 200 words in length, outlining the subject; (c) outline in paragraph form, about 300 words in length, of belief of gas industry's need for the idea, plan, new appliance design, problem solution or whatever matter is submitted, and an estimate of the gains to accrue from the same if adopted; (d) outline of suggested method by which plan or whatever may be most effectively launched. No specific rules as to form or length of subjects will govern in the selection of winners, but brevity is considered highly desirable.

Papers will be reviewed by a committee consisting of Clifford Johnstone, managing director of the association; his assistant, the chairman of the sales and advertising section, and the chairman of committees. This committee will select those papers they consider most worthy of presentation before the spring sales conference, and all papers so selected will be awarded a prize of $10, whether they are presented by the contestant himself or by an alternate. The executive committee of the sales and advertising section will then act as a committee to review all selected subjects for the purpose of determining the most worthy subjects in each of three fields: home service, industrial and commercial sales and domestic sales. These will be awarded a grand prize of $25 each at a special meeting of the executive committee to be held February 14, 1940, in Los Angeles.

The program for the spring sales conference is being built about this unique plan, according to Chairman Rice, and preliminary returns show a keen interest in it, both on the part of gas company sales employes and executives. The conference will be held this year in the auditorium of the Embassy Hotel on Hope Street, and it is timed to coincide with an "open house," celebrating the completion of a gas industry owned Pacific Coast branch appliance testing laboratory in Los Angeles. All members of the gas industry, including dealers, manufacturers, and utility men, are invited to call at the laboratory during the four days of the "open house," where they will be shown through the building by laboratory staff members. February 12 and 13 have been set aside for gas appliance dealers, February 14 for utility men, and February 15 for manufacturers and their friends.

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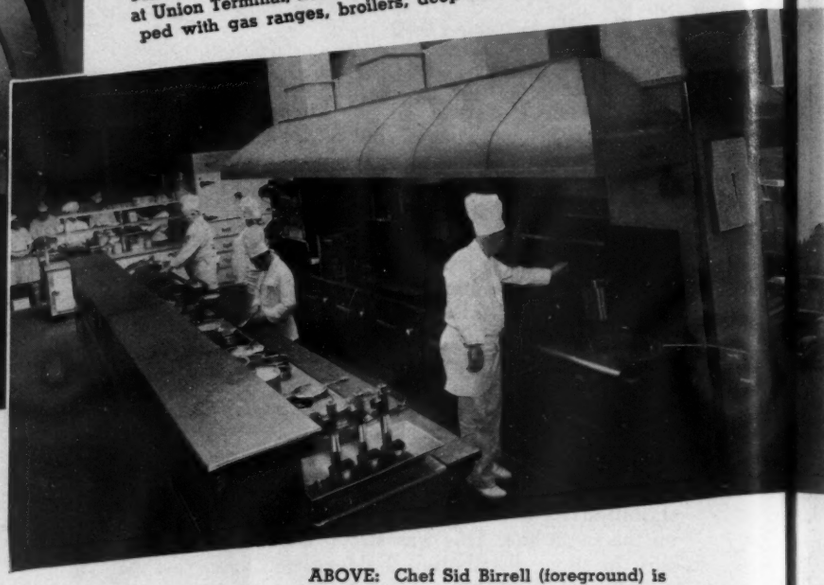
Fifty-Year-Old Company Seeks Franchise Renewal

The Pulaski Gas & Oil Co., Ltd., of Pulaski, N. Y., through its president and general manager, J. Russell Thorn, has applied to the village board for a renewal of its franchise, which terminates March 1, and which was originally granted 50 years ago.

The first franchise was given to Charles Tollner, who sold to George W. Douglas in 1905. Clarence Hilton came into ownership of the properties in 1925, finally selling out to the present concern in 1930.

Main dining room of Fred Harvey's unit completed in 1939 at Union Terminal, Los Angeles. The kitchen below is equipped with gas ranges, broilers, deep fat fryers, bake ovens.



ABOVE: Chef Sid Birrell (foreground) is responsible for the 2000 meals served each day at Union Terminal restaurant.

This kitchen at Simon's Drive-In in Hollywood, Calif., will serve 200 persons simultaneously. Only with gas is it possible to obtain the speed and flexibility needed to accomplish this task. Note the two deep fat fryers. Simon's is a typical drive-in restaurant.

First Choice Among Southern Chef

The All-Gas

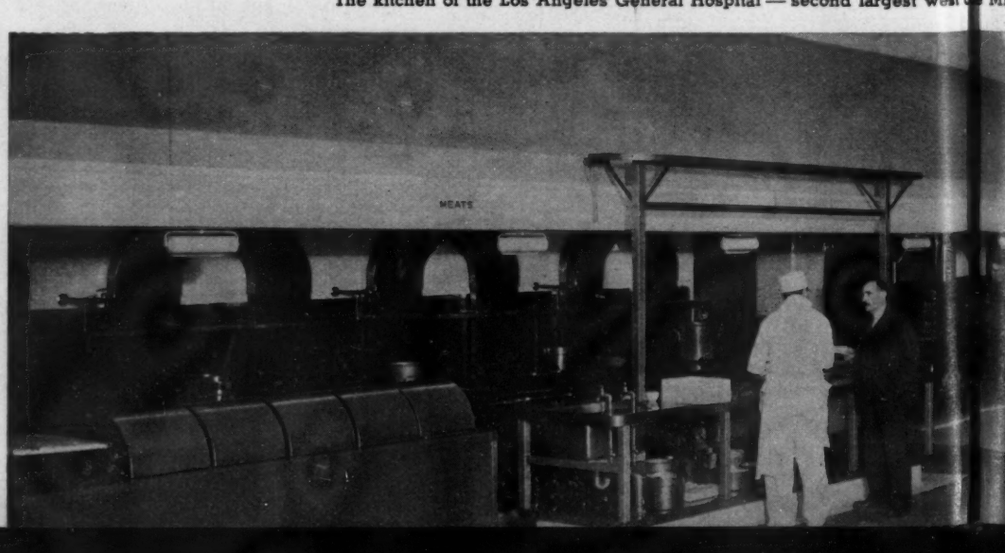
WITH the completion in December on Huntington Drive, in the El Sereno district, Los Angeles, of a new $50,000 link in McDonnell's chain of restaurants, and of two equally elaborate new cafes adjacent to the famous Santa Anita Race Track in Arcadia, Los Angeles moved three paces nearer top ranking as the city with the greatest number of first class restaurants in the land. The year 1939 saw the erection of more than a score of fine new eating houses in this big, bustling city, and every one of them installed all-gas kitchens. As a matter of fact, while the availability of a plentiful supply of this clean, fast, economical fuel probably had little to do with the actual erection of these new establishments, its use for cooking, roasting, broiling and baking certainly has much to do with making them first class.

Among the new restaurants which have attracted the most attention during the year, the new Fred Harvey restaurant in the city's brand new $11,000,000 Union Station should be placed first. It is outstanding in every respect, the kitchen, in particular, being one of the finest ever built here or elsewhere. Finished in white and blue tile, it possesses practically every possible modern restaurant convenience, including refrigeration equipment which even has a separate space for the storage of garbage! Gas equipment, in addition to a bank of heavy-duty ranges, includes a bake oven, a gas-fired steam cooker, deep fat fryers and a salamander broiler.

Two other interesting restaurant installations completed late in the year are a luncheon room in the May Co.'s ultra modern new department store on Wilshire Boulevard, and a tea room in Saks Fifth Avenue store, also recently completed on Wilshire Boulevard. The very latest gas restaurant equipment was installed in the kitchens of both these jobs and is giving a very good account of itself.

McDonnell's new $50,000 Farmhouse Cafe on Huntington Drive, mentioned in the first paragraph, has an interesting all-gas kitchen. This restaurant specializes in steaks, chops and a dish called "Chicken in the Rough," which consists of fried chicken served with shoestring potatoes. The name "Chicken in the Rough" is copyrighted and owes its popularity — which is growing every day — to the method used in frying the chicken. The equipment is a gas-fired pan with a sloping bottom, arranged so that the chicken may be

The kitchen of the Los Angeles General Hospital — second largest west of M



Dining room of McDonnell's $50,000 Farmhouse on Huntington Drive, Los Angeles, completed in December, 1939. Inset: Jack Wombley prepares "Chicken in the Rough."

ABOVE: "Chicken in the Rough" is a Carpenter's specialty at their recently completed restaurant in Arcadia, Calif.

ern California's New Palatial Restaurants

-Gas Kitchen

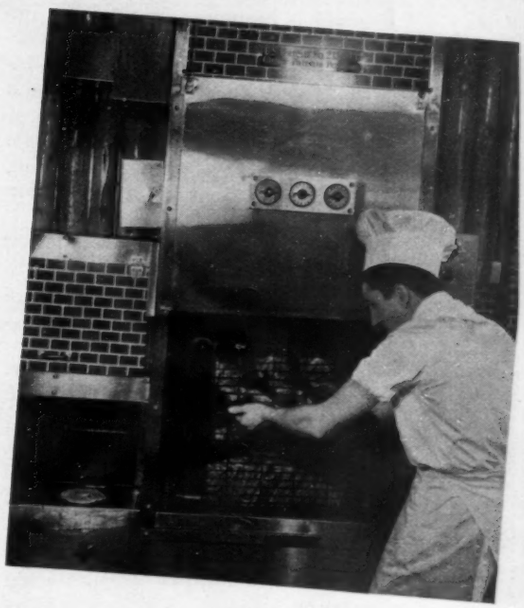
started in deep fat at one end and moved up gradually to brown in shallow fat at the other. The method of cooking is an adaptation of the old frying pan to quantity production, and chefs pronounce it eminently satisfactory.

The same dish is featured at Carpenter's new restaurant adjacent to the Santa Anita Race Track, also mentioned above. This is the latest of a chain of three units operated by C. E. Carpenter, former Kansas City restaurateur. One of the other two units is in Glendale and the third is in Pasadena. These restaurants—and the same thing is true of McDonnell's Farmhouse restaurant—have various types of service, including service at a counter, in a dining room, on a terrace or outside in the patron's car. All of these places have charming cocktail lounges.

As gas is the choice of all the new restaurants that are being erected in this region, so it is the choice of practically every one of the restaurants already existing here. Southern California Gas Co. serves some 5000 restaurants in the metropolitan area. While the majority of these are American and serve American dishes, practically every nationality in the world is represented among the balance.

The gas company maintains a special corps of trained advisors to take care of the restaurant business here. This corps, under the direction of J. L. Hall, is available to assist restaurant owners in the selection of new gas equipment for new restaurants or for the remodeling of existing ones. They make periodic calls on the larger restaurants to check the performance of gas appliances, give information on methods of handling, and the like.

An important function of this department is the development, in cooperation with the appliance testing laboratory, of gas equipment to meet special cooking requirements. A recent example of this was the development of an indirect gas-fired automatic barbecue machine for the Old Hickory Barbecues. After three months of research and testing a gas-fired machine, superior to anything previously available, was perfected, and the management of the Old Hickory Barbecue chain installed one of these in each of their restaurants. In one case electric equipment was displaced. This company also operates the White Log Tavern chain, which uses gas exclusively for all cooking and deep fat frying operations.



Close-up of the gas automatic barbecue installed at the Old Hickory Barbecue in Hollywood. This equipment was designed in the laboratories of the Southern California Gas Company in collaboration with engineers of White Log Taverns, Inc.

west of Mississippi — is 100 per cent gas and serves 12,000 meals each day.

PRINT IN BINDING

INDIRECT-FIRED BAKED ENAMEL OVEN

• **HUGH R. LAMBERTH, Southern California Gas Co., Los Angeles, Calif., is the author of the Pacific Coast Gas Association's Gas Utilization Data Bulletin No. 63, which was produced in October, 1939. The Bulletin is entitled "Indirect Fired Baked Enamel Oven." — Editor.**

THE manufacture of enameled wall board is becoming increasingly important due to the widespread acceptance of this material in the building field as a durable, decorative and economical finish for a multitude of inside and outside uses. The problem was to install an oven for baking enamel on wall board in a production process.

Requirements for the installation were:

1. Normal working temperature range 250° to 300° F., depending primarily on type of enamel used.
2. A maximum temperature differential of 5° F. throughout the oven.
3. Fast recovery with minimum of "hunting" at the temperature setting.
4. Indirect heating, as enamels used finish unsatisfactorily in presence of products of combustion.
5. Well ventilated oven space to dissipate volatiles and provide clean, dry circulating air.
6. Oven space to accommodate 12 boards, each 4 ft. wide by 12 ft. long by 1/8 in. thick, which are supported on a steel rack 4 ft. 4 in. wide by 6 ft. high by 12 ft. long. Boards are laid flat, enameled surface up, and spaced 5 in. apart vertically. The bottom board is 17 in. above the floor and the top board 6 ft. above the floor.

Construction

The oven was developed and installed by Industrial Oven and Equipment Co., who control patents covering certain features. The cross sectional view in Fig. 1 shows relative position of boards in the oven. Inside dimensions are 7 ft. by 7 ft. by 16 ft. long; outside dimensions, 7 ft. 6 in. high by 8 ft. 10 in. wide by 16 ft. 4 in. long. Each end is equipped with full size double doors.

Insulation is 3-in. granulated rock wool on sides and top and 2-in. on doors. Between the outside insulation and the inner side walls is an 8-in. wide space extending the full length and height of the oven. This space connects at the top to a 3-in. space which extends across the top of the oven towards the center.

At the bottom of this space near the floor, on each side, are four drilled pipe burners, each 3 ft. long, extending the length of the oven. Secondary air is provided through ports in the insulated outer wall.

The hot combustion gases rise through this space, which is baffled to insure intimacy of contact with the inner oven wall, flow across the top of the oven and thence through dampered openings to an exhaust duct which extends the length of the oven. Each side of the oven furnace space has a separate exhaust system connecting to a common stack in the center.

Temperature control is provided by thermostatically controlled, "on and off" type, solenoid valves located in gas supply lines to each side of the oven.

Air from the circulating blower is distributed through horizontal lengthwise ducts located near the floor inside the oven, and discharged inwardly across the oven floor through adjustable openings. Air is returned to the circulating blower through a horizontal lengthwise duct, located within the oven walls along the top center line, which is equipped with adjustable openings along each side. Fresh make up air is taken through an air filter at the blower suction.

Due to the relatively large volume of venting necessary in this process, especially during the early stages of baking, a separate small vent blower takes suction through ducts from each corner of the oven 8 in. above the floor and discharges through a separate vent stack to the outside.

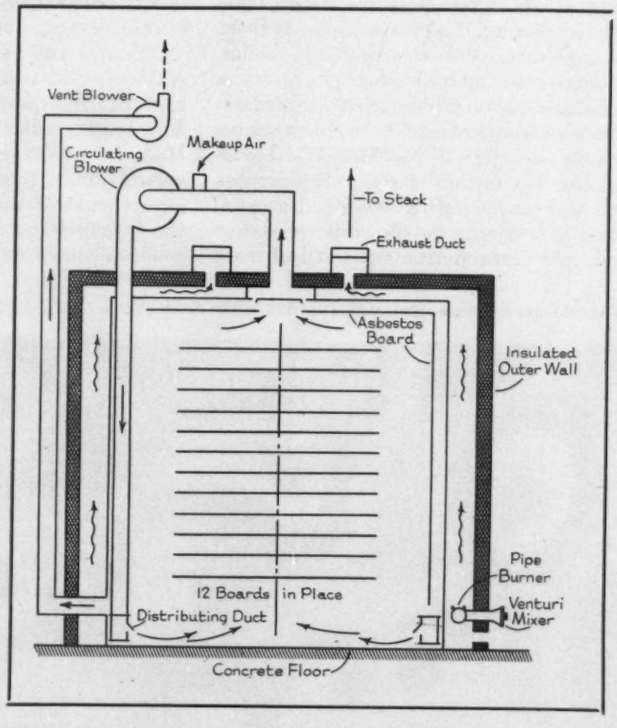


FIG. 1.
Baked enamel oven.

As edges of boards are only 18 in. from the hot side walls, the walls adjacent to the boards are covered with asbestos board, spaced out from the wall 3 in. and continuing across the top of the oven with a 2-in. clearance. The space thus formed is open to the oven space at top, bottom, and ends so that a free circulation is provided along the heating surfaces. Circulating blower has a capacity of 1220 c.f.m., the vent blower 275 c.f.m.

Operation

Standard boards are baked twice, once for surface coat and once for finish coat. Where boards are intended for severe usage, a second finish coat is applied which necessitates a third baking. Surface coat is usually baked at 250° F. and finish coats at 300° F.

First, a rack of boards is sprayed with surface coat, allowed to set for one hour or more and then placed in the oven. This coat is allowed to come up to the required temperature and then baked for one hour after the desired temperature is reached. Surfaced boards are then rubbed down and sprayed with finish coat, which is allowed to set for at least 30 minutes to allow the thinner to evaporate. The boards are then placed in the hot oven, brought up to temperature and again baked for one hour.

The full open burner capacity is 500 cu. ft. per hour of 1120 B.t.u. per cu. ft. gas, which is equivalent to an input rate of 714 B.t.u. per hour per cu. ft. of oven space. Repeated tests have shown the maximum temperature variation between any two points on the rack of boards to be within 2° F. The difference occurs only at the ends of rack near the floor.

One typical day's operation, in which seven full racks were baked, required a total elapsed time of 10 hours and 10 minutes from starting the oven cold to removal of the seventh rack finished. The runs consisted of one rack of surfacer which had air dried overnight, three racks of wet surfacer, and three racks of finish enamel. A few of the findings are tabulated below:

1. Total gas consumption (7 racks) ..... 4400 cu. ft.
2. Average gas consumed per run ..... 629 cu. ft.
3. Average B.t.u. input per sq. ft. of board per run..1221 B.t.u.
4. Average B.t.u. input per sq. ft. of finished board (2 bakes) ..... 2442 B.t.u.
5. Average total time per run ..... 87 min.
6. Average time per run to recover temperature drop due to opening doors and fresh material put in..... 27 min.
7. Net baking time per run at desired temperature.... 60 min.

The conclusions drawn from the installation of this oven are as follows:

1. This oven has a close temperature control and uniform heat distribution.

2. Temperature recovery is fast and operation simple. No adjustments are required other than setting thermostat.

3. Oven is compact and the design is adaptable to practically any existing oven at reasonable conversion cost.

4. This same type of oven has been successfully used in various types of enameling processes requiring temperature under 500° F.

■ ■

Appliance Manufacturers Hold Three-Day Meeting

Manufacturers of gas appliances from all parts of the United States attended a series of meetings in Cleveland, Ohio, January 22, 23 and 24, it has been reported by C. W. Berghorn, managing director of the Association of Gas Appliance and Equipment Manufacturers. The sessions were devoted principally to the planning of national sales promotion in behalf of gas appliances. In addition, there were discussions on market trends and research laboratory activities.

W. L. Seelbach, Forest City Foundries Co., Cleveland, presided over the meeting of the Gas House Heating and Air-Conditioning Equipment Division; L. R. Mendelson, Hotstream Heater Co., Cleveland, was in charge of the Gas Water Heater Division meeting; and E. C. Adams, Adams Brothers Mfg. Co., Pittsburgh, presided over the meeting of the Direct Heating Equipment Division.

■ ■

Bonds and Preferred Stock Offered by American Gas

The American Gas & Electric Co. has made a public offering of three series of debentures and one issue of preferred stock, according to news reports from Canton, Ohio. The prices were included in an amendment filed with the Securities and Exchange Commission at Washington to the $65,000,000 registration statement which became effective Jan. 7.

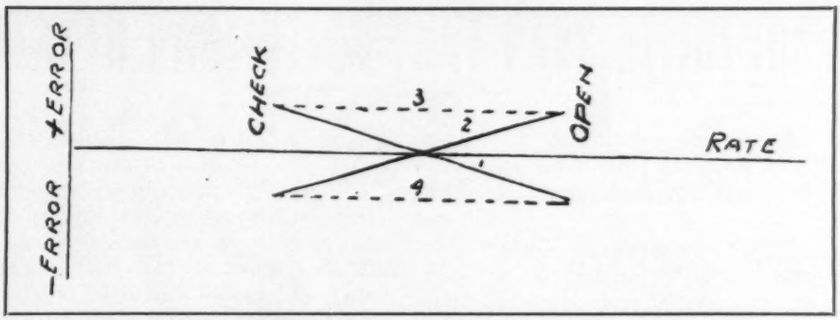


FIG. 1. Normal meter proof curve.

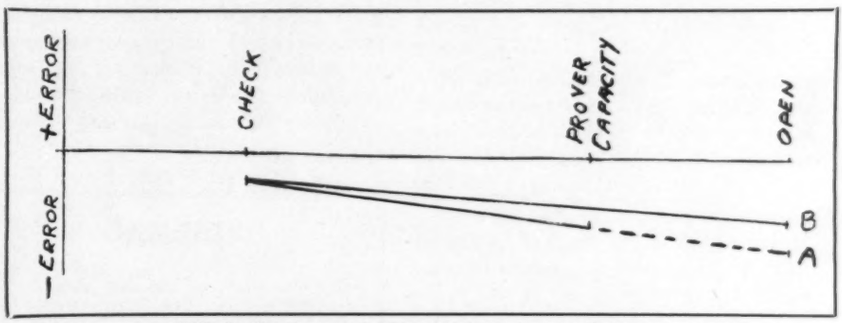


FIG. 2. Proof curve for large meter using small prove.

CALIBRATION OF POSITIVE METERS

• **H. J. STERK, superintendent, meter shop, Peoples Gas Light and Coke Co., Chicago, Ill., in a paper, "Periodic Testing of Positive Meters," presented before the Mid-West Gas School and Conference, Iowa State College, November 13-15, 1939.—(Abstract by GAS.)**

THIS article deals with Practical Limits of Error on "As Left Calibration," which is defined as that final proof left on a meter previous to being set for service.

The actual calibration or adjustment consists of making the meter operate at pre-determined error limits for a range between 20% of the rated capacity and at the rated capacity. A proof curve plotted, using rates of flow for the abscissa and per cent error for the ordinate, will result in a straight line, provided there are no excessive binds or D. R. in the meter.

If fast errors are considered positive and slow errors negative, it follows that the direction of curve (1) will be slow (down) if the check test is fast and the open check is slow with its rate of declination dependent upon the difference of the two tests. When the check test is slow and the open test is fast, then the curve (2) will be fast. Other curves may be constructed with both the check and open test either fast (3) or slow (4) which keeps the curve either on the positive side (fast) or the negative side (slow).

These curves bring out two facts:

1. The advisability and direct reason for holding the check and open error within pre-determined limits (usually together or not more than 0.5% apart).

2. That if large meters are adjusted on small provers where it is impossible to obtain the maximum rated capacity, then the difference in error should be so determined that the proper curve will result. (See Fig. 2.)

(A) Curve is progressively slow as extended to rated capacity and (B) curve closer to correctness. It has been the practice to enlarge the prover openings to increase the discharge.

The most common practical limits of error are plus or minus 1.0%; limits obtainable though the economics of repairing must necessarily be considered. This can be explained by our shop procedure. It has been found that on a partial repair of the new type (B meter) that the "as left calibration" can be made by adjusting the tangent bat, whereas on a partial repair meter of the old type (small capacity) it will be necessary to move the tangent to bring the speeds together along with the in or out bat adjustment. If the older type were rebuilt, it would undoubtedly pass as well as the newer type. Since our company now has natural gas, the meters are much cleaner than they were during the period when manufactured gas

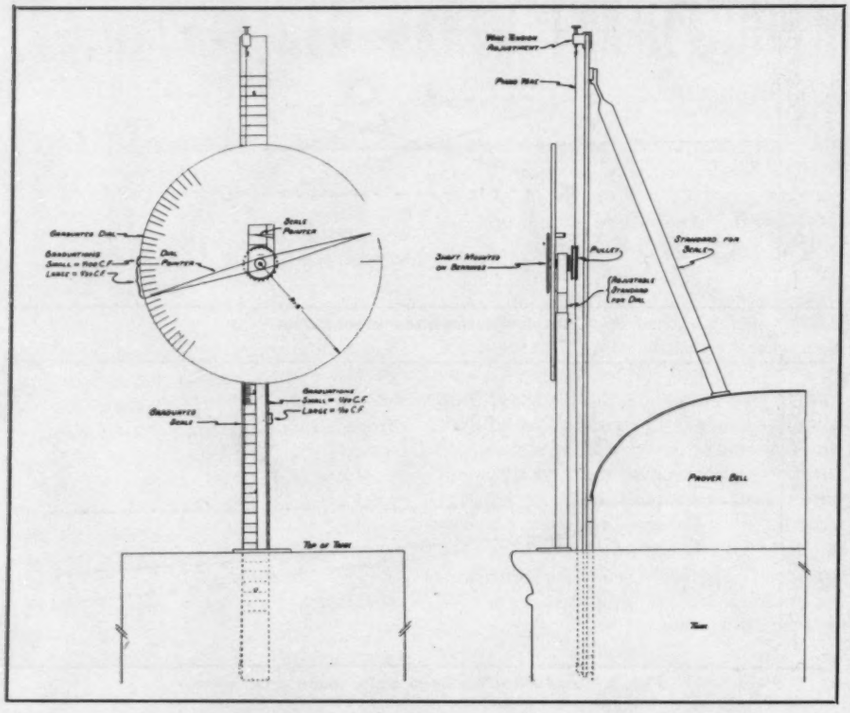


FIG. 3. Dial indicator to magnify prover scale readings.

was used and they are holding much better proofs. It is recommended that more attention be devoted towards thoroughly cleaning the meters, coupled with the care customarily used to eliminate lost motion both below and above the table. It is customary for us to remove about 30% of the triangles to renew valve arms, cranks and center boxes, with a higher percentage on king post and flag arm replacements. Thus, the practical limits of error on "as left calibrations" can be corrected to the method of repairs.

The facilities for making calibrations must be considered. If the provers are handled properly, kept clean, free of binds and the cycloids in adjustment, then they should hold their accuracy without frequent bottling.

Dial Indicator

Fig. 3 shows a dial indicator to magnify prover scale readings. The dial is so enlarged that its circumference may be graduated so that each graduation is at least four times the graduation on the prover scale representing a corresponding volume. Slight movements of either the meter tangent or the tangent bat are therefore greatly magnified on its scale divisions, permitting easier and better adjustments. The pointer for this dial is actuated by a wire wrapped around a connecting pulley, with one end of the wire attached to the top of the prover scale and the other at the bottom. The circumference of the pulley determines the amount of travel of the dial pointer. By keeping its dial diameter at 12 in. then the amount of travel for the end of the pointer is about eight times the amount of prover scale movement. If a five light meter is adjusted on three revolutions of the tangent (½ cu. ft. displacement) the prover scale moves 2½ in. and the dial pointer would move through an arc of about one-half the circumference or about 19 in. (19:2½::7.5:1). Consequently, any change on the tangent during adjustment would be magnified 7.5 more than that shown on the prover scale. In other words, the error left in a meter when a ½ cu. ft. aadjustment is made would be equivalent to the error in two revolutions (4 ft.) of the proving hand and would be comparable to the scale accuracy provided the errors are accumulative.

Adjustments can be made very quickly, especially when a check rate of 60 cu. ft. per hour is used in making the adjustment. It should be understood that the final 2 ft. run should be at the regular 30 cu. ft. per hour. It seems that the practical limits of error can be governed closer on new or well repaired meters with properly bottled provers. A spread of 1% error may be sufficient as practical limits in some shops and others with worse gas conditions may need a spread of 2%. Articles have been written on the effect of parallax on repeated readings and this undoubtedly may affect the theoretical limits of error on "as left calibration."

There is one important factor for consideration on making practical limits of calibration, and that is the results and effects on incoming tests of meters from service. With suitable meter data the results of a change in "as left calibration" can be traced through meters in service for various succeeding years for the effect in amounts of registration and revenues. Where many utilities have been keeping their meters between 0.0 and —1.0% they may find it advisable to make changes.

■ ■

Rehearing Asked on FPC's Accounting System Order

THE Federal Power Commission has received an application from the American Gas Association's Committee on Uniform Classification of Accounts for Natural Gas Companies for a rehearing and reconsideration of the commission's order, effective, Jan. 1, prescribing a uniform system of accounts for natural gas companies under the Natural Gas Act.

The Association and 20 individual companies request in the application that 13 changes be made in the accounting system. These relate principally to accounting for expenditures made in acquiring leaseholds, for depreciation and amortization of gas plant, natural gas land and land rights; to reclassification of accounts on the basis of original cost; exploration and development costs, and cost of renewing and extending leaseholds. They urge that labor, payroll and other taxes and interest during construction be included in a general account for each of these items without requiring allocation to each particular job.

In reporting "original cost," they suggest that provision be made for more specific forms or instructions in order that complete uniformity may result.

The final item is a complaint that the system of accounts does not provide adequate accounting for non-utility operations such as gasoline plants and oil wells.

■ ■

Montana-Dakota Utilities Co. Buys Minnesota Concern

The Montana-Dakota Utilities Co., with headquarters in Minneapolis, and operating 129 electric and natural gas properties in the north central states, has recently acquired the Crookston (Minn.) Peoples Gas Co.

Crookston is one of a number of communities in the Red River Valley in Minnesota that is to be served by a proposed natural gas pipe line that will extend eastward from Bismarck, N. D.

The Montana-Dakota Utilities Co. has been granted a tentative permit by the Federal Power Commission to serve the Red River Valley, including Fergus Falls, Wahpeton and Breckenridge, Minn. R. M. Heskett is the executive officer in charge of operations.

■ ■

Clarence E. Willey Dies

Clarence E. Willey, for 14 years with the Central New York Power Corp., and lately assistant superintendent of gas production, died in Syracuse on Nov. 30. He was a graduate of Syracuse University.

HEALTH PROMOTION THAT PAYS DIVIDENDS

• **G. W. CANNON, vice president of the Campbell, Wyant & Cannon Foundry Co., in an address entitled "Promoting Health, Hygiene, and Safety in a Moderately Sized Plant," presented before the National Association of Manufacturers Congress of American Industry at the Waldorf Astoria Hotel, New York City, December 8, 1939. — (Abstract by G A S.)**

NO matter how one looks at the subject of health and safety promotion—whether from a humanitarian viewpoint, or whether from the standpoint of a net saving in operating expense, our company records prove that a well organized health, safety and good housekeeping program actually pays! In addition to this, such a plan brings about a more closely knit organization—employes realize that the management has their interests at heart.

Through this plan we have saved on our liability insurance costs, sufficient to pay for our entire health and safety program. Because of the vigilance of our supervision and our Medical department, visiting nurse's calls have been reduced approximately 50% in the past three years and she still calls on every absentee! Through this program we have prevented much illness and saved many lives because the service is in operation taking care of our employes before a health or accident problem becomes serious.

In order to have the best possible sytem of making health examinations, the methods used by employers of 500,000 men, including both the nation's large and small industries, were checked. Then we even went beyond what some of them do. This is particularly true on rechecking men, and on blood tests.

Three-Part Examination

Examinations are divided into three parts—the history, physical examination, and the laboratory procedure.

The history is taken on a regular form, is signed by the applicant and verified for our records by the attendant. An employe is given a complete physical examination. The examination includes an X-ray of the chest, a Kahn blood test, and a urine examination.

Proper examination must also include some arrangement for periodic re-examination. With our method of classification in different health groups, we are able to see to it that the sub-standard groups receive more medical supervision than the normal vigorous worker.

In addition, the Medical department attempts to perform a function in diagnosing disease. We have found that employes do not consult a physician unless they are actually incapacitated. They will, however, seek advice and assistance from their company medical department for mild disorders. Many of these are insignificant but some signify the beginning of a dangerous condition. It is in these cases that the industrial physician has an opportunity for early diagnosis, thereby preventing much worse developments. It is our custom to refer these patients to their family physician and to see by follow-up that they consult him.

For the past five years we have been educating our employes on the personal value to them of the shop slogan "Safety Always Pays." That they are becoming increasingly conscious of this fact is indicated by the following record:

In 1935 our percent of hours lost to hours worked was 1.73%. In 1938 this was down to 4/10ths of 1% and only 2/10ths of 1% in the first 10 months of 1939.

Lost time accidents were as follows: In 1935, 213, to 49 in 1938 and to only 30 in the first 10 months of 1939, or 1/7th of the number of accidents in 1935.

A Great Saving

For 10 months in 1939 we have increased our man hours by some 125,000 over our total for the year 1938 in spite of which our hours lost due to accident as compared to hours worked is just one half of our 1938 record. The Safety department maintains that this record is largely a result of our physical examination.

We have developed a great spirit of competition to secure "no lost time" accident records. Because of their desire to keep a good safety rate, our employes even help newcomers until they learn their jobs.

Knowing that a Safety Program cannot be successful without "Good Houekeeping," we are stressing this phase of our campaign equally as hard as our Safety Program.

Each department is furnished with a "Good Housekeeping" record card marked daily by the safety inspector. Monthly prizes with a letter of commendation, plus the privilege of displaying a bronze plaque for winning first, second or third place, creates a competitive spirit in "Good Housekeeping" that keeps the contestants alert and interested.

Proper lighting, heating and ventilation are carefully checked. Light meters tell us whether we are maintaining proper illumination. Sufficient heat must be furnished to create bodily comfort. General plant ventilation is under the control of a trained man for each shift. Dust counts are taken by a staff chemist and control corrections

CALENDAR

February

Eastern Natural Gas Regional Sales Conference—Fort Pitt Hotel, Pittsburgh, Pa., February 29-March 1.

Mid-West Regional Gas Sales Conference—Palmer House, Chicago, February 15-17.

Pacific Coast Gas Association Spring Sales Conference — Held in conjunction with open house of the A.G.A. Testing Laboratory, Los Angeles, February 12-14.

Southern Gas Association and Southern-Southwestern Sales Conference — Annual Convention, Hotel Arlington, Hot Springs, Ark., February 12-14.

March

American Gas Association Conference on Industrial Gas Sales—Commodore Perry Hotel, Toledo, Ohio, March 28-29.

New England Gas Association—Annual Convention, Hotel Statler, Boston, Mass., March 14-15.

Wisconsin Utilities Association, Gas Section—Annual convention, Hotel Pfister, Milwaukee, Wis., March 11-12.

April

American Gas Association Accounting Section—Spring Conference, April 11-12.

Mid-West Gas Association — Annual Convention, Lincoln, Neb., April 15-17.

Missouri Association of Public Utilities—Annual Convention, Elms Hotel, Excelsior Springs, Mo., April 17-19.

New Jersey Gas Association—Annual convention, Asbury Park, N. J., April 9.

Southwestern Gas Measurement Short Course—College of Engineering, University of Oklahoma, Norman, Okla., April 16-18.

May

American Gas Association Distribution Conference—Houston, Texas, May 6-10.

International Petroleum Exposition and Congress—Tulsa, Okla., May 18-25.

Natural Gas Section, A. G. A.—Annual Convention, Houston, Texas, May 6-10.

Pennsylvania Gas Association—Annual convention, Skytop, Pa., May 6-9.

July

Canadian Gas Association—Annual Convention, Jasper Park Lodge, Alberta, July 3-5.

Pacific Coast Gas Association Northwest Conference — Held in conjunction with Canadian Gas Association, July 3-5.

September

Pacific Coast Gas Association—Annual convention, Hotel del Coronado, Coronado, Calif., September 18-20.

October

American Gas Association — Annual Convention, Atlantic City, N. J., week of October 7.

Servel's Complete Sales Aids

YOU CAN INCREASE YOUR SALESMEN'S CAPACITY BY TAKING FULL ADVANTAGE OF THESE PROMOTION AND DIRECT MAIL PIECES

SERVEL'S 1940 promotion pieces and sales aids set a new pace in streamlined sales strategy!

Are you using Servel's new, complete sales presentation plan? Are doors being opened for your men by the newsy, colorful tabloid mailing piece? Have they the latest Servel miniature bank, salesman's rule, Spud-Klixon Disc Tag?

They're keyed to carry the full momentum of your national and local advertising right into prospects' homes . . . set the stage for your men to close sales in a greater percentage of their demonstrations.

"Opportunity Year" for Gas Refrigeration

The increasing new-user and expanding replacement markets . . . the growing recognition of Servel's exclusive operating advantages . . . your 1940 product . . . the national advertising . . . all have paved the way for you to cash in on your opportunity.

It's in *your* hands to set the stage for your men to get the kind of results you want . . . by giving them the full benefit of Servel's promotion and sales aids, and the proper training to use them to the greatest advantage.

(*Right*) Here's a key piece in Servel's 1940 Sales Presentation Plan Kit. This presentation book is tab-indexed, full of pictures—every page carries a sales wallop. Also in the complete Plan Kit are De Luxe Companion Booklets digesting the main book, and model specification supplements.

(*Left*) This direct mail piece will carry your Servel story to large numbers of potential prospects at very low cost.

LIFE BEGINS IN '40...

Help Set The Stage For Sales

HERE'S WHAT WE MEAN BY COMPLETE...

To Set the Stage for Sales:
- 4-Color Tabloid Mass Mailer
- Envelope Stuffers
- Gas Bill Ads

For Home Demonstrations:
- Complete Sales Presentation Kit Including:
- Sales Presentation Book
- 50 De Luxe Companion Booklets
- Model Specification Supplements

For Illustrating "Differences":
- Bubble Demonstrator
- Giant Matches

For Closing Sales:
- Salesman's Rule
- Spud-Klixon Disc Tag
- Miniature Bank

For Showroom Floor Demonstrations:
- Catalogue Folder
- Miniature Freezing System

For Group Demonstrations:
- Group Demonstration Sound Slide Film
- Hostess' Gifts
- Gifts for Guests

For Trailer Demonstrations:
- Servel Sales Trailers

For Multiple Sales:
- Apartment Model Folder
- Architect's Data Folder

Inducements for Salesmen:
- Star Salesman's Buttons

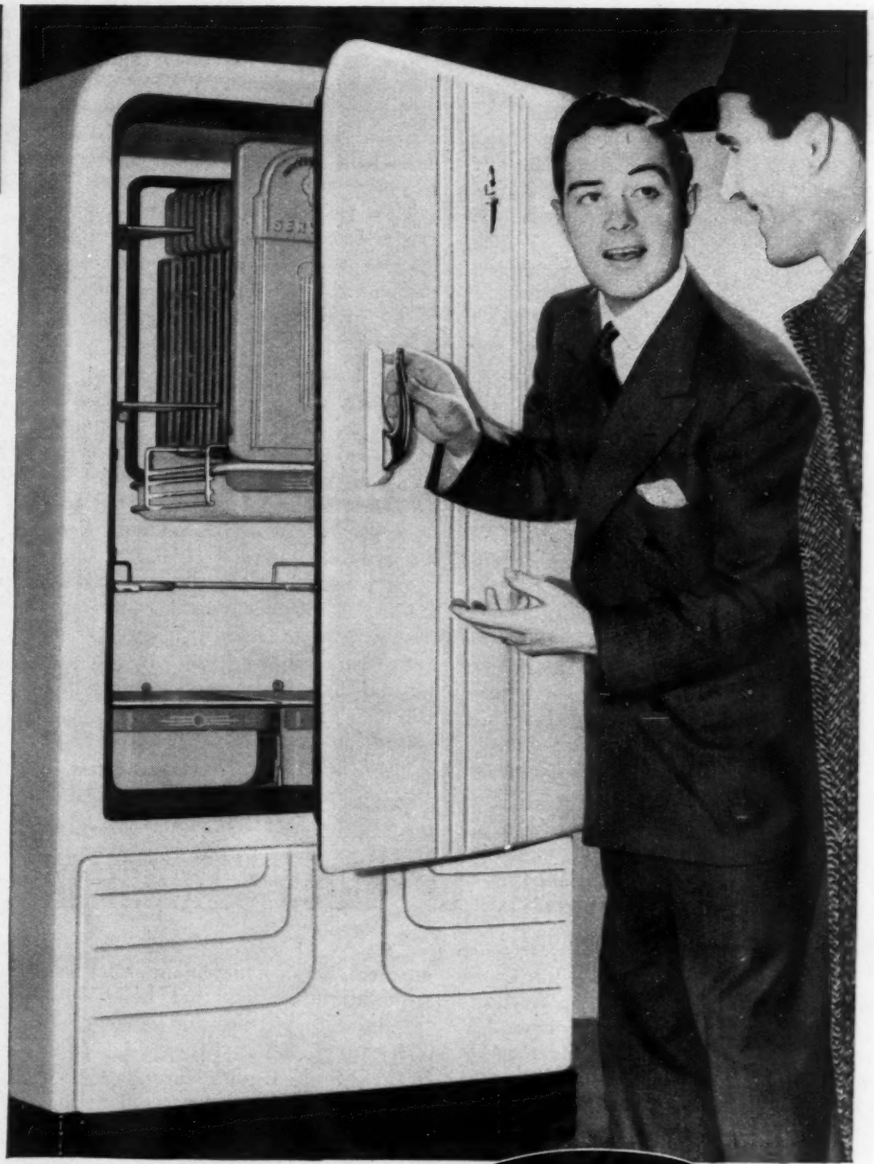
Salesmen's Magazine:
- The Servel Salesman

Home Service:
- Home Service Bulletins
- Home Service Booklets
- Home Service Playlets
- Beauty Tissues
- Recipe Booklet

Utility Magazine:
- Utility News

Contests for Awards and Cash:
- Great Antarctic Exploration Campaign

Special Promotional Tie-Ins



FOR FULL DETAILS REGARDING THESE AND OTHER SALES AIDS WRITE:

Servel Electrolux Sales Promotion Dept.

SERVEL, INC.

Evansville, Ind.

The **SERVEL** **ELECTROLUX** *Gas Refrigerator*

FOR GAS REFRIGERATION

are continuously made. Brightly illuminated rest rooms, often repainted, have stopped previous malicious destruction of fixtures. A large portable vacuum cleaner removes dust and dirt throughout the foundry, thereby creating better, healthier working conditions and a decreased occupational disease coverage cost.

All injured employes must go to the First Aid department regardless of how slight the injury may be. This applies equally to any employe suspected of running a temperature. That is one of the ways we have cut our hours lost to hours worked in five years due to accidents, from 1.73% to 2/10 of 1%; cut the need for sick benefits paid by the Aid Association in three years approximately 50%; and our insurance cost to the point where the saving pays the cost of our entire Health and Safety Program.

The Aid Society is independently operated and controlled by employes. Membership costs each man $1.00 per month. He can receive benefits totaling $120.00 a year for three years. At the end of 90 days continuous active service, each man gets $500.00 of group life insurance. In nine months this is increased to $750.00; in 15 months to $1,000.00—all of this at no added cost over the $1.00 a month he pays to the Aid Association. His dollar a month is supplemented by an equal contribution from the company.

As part of the Aid Service, a nurse calls at the employe's home when he is absent from work. If necessary, she suggests that the family physician be called. The Association arranges for financial and medical help when needed. The nurse calls each day or as needed until the employe recovers. The nurse also helps out in illness of the wives and children.

Safety and safe working conditions are a matter of *education* and must have the wholehearted support and cooperation of management, supervision and workers. This program is continually sold through the columns of our monthly shop magazine.

This activity has brought workers and management closer together. Employees like the program and seem anxious to correct the physical defects found in the course of the examinations.

The results received represent the combined effort of a consistent plan of medical examination and treatment; placement of workers in the jobs for which they are best fitted; shop improvements and a well organized accident prevention and good housekeeping program.

As a result of our program we are making a 30% saving in insurance costs. We are actually insuring our entire liability at a lower net cost than we did five years ago, proving that our men are more gainfully employed because of better health and fewer accidents.

A. G. A. E. M. Plans CP Sales Campaigns

UNDER the theme, "Join the Profit Parade," a new sales plan portfolio outlining the spring-summer CP range campaign is to be issued soon by the Association of Gas Appliance and Equipment Manufacturers, it has been announced by Lloyd C. Ginn, chairman of the CP gas range sales management committee. The backing given the nation-wide promotion of CP ranges by the American Gas Association, cosponsor of the sales endeavor, is also described in the plan book.

In addition, George Scoffield, chairman of the A. G. A.'s Domestic Gas Range Committee, has announced the appointment of eight regional managers and 48 state managers to be assisted by the field staff of the A. G. A. E. M. in projecting CP range promotion.

Incorporated in the portfolio are suggested newspaper advertisements and radio spot announcements. Colorful mailing pieces, handouts, bill enclosures, display pieces and other sales stimulating material are being made available to utilities and dealers.

Regional and state CP managers are being supplied with three attention-arresting items to assist them in their campaign-developing work: a sound slide film, "Straight to Your Heart," which tells the story of the various features of CP gas ranges; a set of 45 four-color charts which present the CP range from a food and health savings standpoint; and a second film titled "The Parade to Profits," which dramatizes in 15 minutes the CP program, the market and profit possibilities.

Frank H. Adams, president of the A. G. A. E. M., has announced that part of the $110,000 cooperative budget for 1940 promotion of CP ranges, which is double the 1939 appropriation, would go toward manning a field staff to conduct sales training and educational development work.

Associated Gas Subsidiaries May Be Consolidated

NEGOTIATIONS are under way to purchase five southwestern subsidiaries of the Associated Gas & Electric Co., of Ithaca, N. Y., according to Dallas Rupe & Son, investment bankers of Dallas, Texas. The properties to be included are the Arkansas General Utilities Co., the Louisiana Public Utilities Co., Inc., the Texas General Utilities Co., the Arizona General Utilities Co., and the Panhandle Public Service Co., the last named an Oklahoma concern. Approximately $7,000,000 in properties is involved.

The new company will be headed by Glenn C. Hyde, now vice president of the Utility Management Corp., of New York, and its proposed office will be in Dallas.

Final approval of the deal must yet be obtained from the Securities and Exchange Commission. The sale of these companies will be one of the first major moves of large utilities to comply with the general order of the SEC for the geographical integration of large company holdings.

Dallas Rupe & Son have recently underwritten a $260,000 first mortgage bond issue for the Guthrie Gas Utilities Co., of Guthrie, Okla.

■ ■

Reading Company Remodels Showroom and Offices

More than 7000 visitors inspected the remodeled sales floor and offices of the Consumers Gas Co., Reading Pa., during the recent week of open house. The alterations to the building included a new front, a new model kitchen, and an additional cashier's cage on the first floor, and more office space, plus a new auditorium seating 250, on the second floor.

Twice daily during open house week, Lillian Merkle, home economics director, conducted demonstrations in the new kitchen, preparing complete meals. At one of the demonstrations cakes, cookies and gas toasters were distributed as gifts to the audience.

■ ■

New 12-Mile Line Augments Gas Supply at Garden City

A new 6-in. pipe line is being constructed from the O. J. Brown gas well, 12 miles southwest of Garden City, Kan., to the Argus Gas Co.'s main line at the edge of Garden City. This line will replace a 2-in. surface line through which was supplied a portion of the gas used in Garden City, and will insure consumers against interrupted service should anything happen to the main line. The line was to be completed the latter part of January, according to L. C. Petticord, local contractor in charge of all the construction work.

■ ■

Safford System Started

Construction of a natural gas distribution system in Safford, Ariz., was begun the latter part of January, following a release of WPA funds for the project, according to A. A. Weiland, town engineer. The Crane Co. has the contract for the laying of the system. Mr. Weiland estimates the project will be completed in about four months.

■ ■

Oberlin Has Rate Change

The Ohio Fuel Gas Co. has recently announced a new gas rate contract for its customers in Oberlin, Ohio. The new rates will benefit the moderate and large consumers, but will increase the minimum charge for the small user.

Who's the "WIZARD OF COOKERY?"

ONCE UPON A TIME there was a salesman named John who dreamed a wonderful dream. He dreamed that a jovial little fat man came into his store and said, "I am a Wizard. If I stand behind you and wave my wand, women will flock into your store and you'll be able to sell and sell and sell!"

John was incredulous. Things were just so-so with him. It was such an effort to make a lot of sales so he just took the easy ones and let the rest slide. It was much more fun to sleep and dream.

So he said to the Wizard, "I don't believe you for a minute, but I'd like to see you try." So the Wizard stood behind John in his store, raised his wand, and immediately the door popped open and a lot of women paraded in. Each woman signed on the dotted line. John was overcome with joy.

"What's your secret?" he asked the Wizard. "It's not a secret, it's my line." And with that the Wizard leaned over and whispered in John's ear.

When John got to the store next morning, he remembered the line the Wizard had whispered in his ear. "It won't hurt to try it", he said to himself. So he did, and to his surprise he made more sales than ever that day. The next day was the same, and the next and the next. John was known as a crack salesman throughout the land and he lived prosperously ever after.

NOW, to follow John's example and make more sales in 1940 than ever before, all you have to do is to follow the hint of the "Wizard of Cookery." You *don't* know who this Wizard is? Well, just you watch for the big announcement in the March issue of GAS. Or, if you can't wait, write American Stove Company's nearest division office and ask for details on how to get the "Wizard of Cookery" to exert his magic on your sales.

© 1940 AMERICAN STOVE COMPANY

Walter B. Schultz, sales manager; Warren Leigh, Fred Byers and Victor Robicheaux, refrigerator salesmen, are shown with one of the two demonstration trailers operated five days each week by DuLaney's, Oklahoma City, Okla., appliance dealers.

TRAVELING SHOWROOMS BOOST SALES

By O. D. HALL

TWO automobile trailers, equipped for gas refrigerator demonstration purposes, each manned by a group of well-trained salesmen, are important aids to DuLaney's, Oklahoma City, in the demonstration and sale of gas refrigeration for the home, according to Luther T. DuLaney, owner of the firm.

Mr. DuLaney revealed that, largely through this method, from September of 1938, when the demonstration trailers were added, and through the first eight months of 1939, his company had been able to show an increase in sales of gas refrigerators of from 35 to 40 per cent.

Two Stores Operated

DuLaney's has two stores in Oklahoma City, the main location, at 711 North Broadway, and a branch at 2618 South Robinson. The firm is the exclusive retail dealer for Servel Electrolux gas refrigerators and well known lines of gas ranges, gas water heaters, gas floor and space heaters, and other appliances and equipment, in Oklahoma City and in several towns and rural districts in the immediate vicinity of Oklahoma City.

Each of the trailers carries an 8-cu. ft. gas refrigerator and a comfortable chair for use of the prospect while the sales demonstration is being made. These refrigerator units are not placed in the home on trial and are not connected with gas for actual operation in the trailer. The salesman, however, invites the prospective customer into the trailer, which is parked at or near the prospect's home, and then shows the construction and advantages of the unit. Usually it is not difficult to induce the housewife to enter the trailer for a demonstration as she does not have to dress especially for the occasion nor take the time for a trip downtown, Mr. DuLaney pointed out.

When asked for details of the trailer demonstration method employed by DuLaney's, Walter B. Schultz, sales manager for the company, said:

"We first give our new salesmen a week of careful training in our main office to familiarize them as much as possible with our policies, our products and sales methods. Then, under my personal direction, the salesmen are given a week's training in the field with the trailers. We carefully observe them, guide their efforts, and help them in making demonstrations and closing sales. By the end of this two-weeks period we are usually able to determine whether a new salesman is adapted for our requirements."

Mr. Schultz explained that the new salesmen, in groups of four or five, are sent out with a sales supervisor to actively canvass their territories two hours per day, from Monday through Friday. They may spend their afternoons in the office recording and arranging their prospect lists and making engagements for evening calls.

The Time Is Fixed

"We fix a definite time for daily trailer selling," Sales Manager Schultz said. "This usually is from 9:30 to 11:30 A.M. Each trailer is attached to an automobile of a supervisor or the sales manager, who accompanies the sales crew. All appraisals of used equipment, taken in on trade-ins, are made by a supervisor or sales manager. In this way we maintain a uniformity and consistency in trade-in values and practices. The sales management, also, always holds itself in readiness to go out, upon request, and help any salesman make a demonstration or close a deal."

Mr. DuLaney, owner of the appliance firm, claims a number of advantages for the trailer method as applied by his firm. "This method has enabled us to know just what our salesmen are doing, to keep a record of their activities and to keep them working, happy and productive," he said. "It also helps us in follow-ups and in closing sales where it is impossible to get a prospect into one of our stores."

The salesmen, who accompany the trailers, make a refrigeration survey in the homes they visit. This is recorded on folder blanks specially provided by the company for the purpose. On the first inside page of the folder is recorded the make, age, cubic size, condition of exterior, condition of interior, number of ice trays, number of cubes, of the refrigerator that is found in the home at the time. The number of persons in the household, including help, is also recorded. Also in this column is space for a record of original monthly and yearly operating and repair costs of the refrigerator which the salesman finds in the home. These costs are compiled from information secured from the housewife.

Space is reserved at the top of the second column for a picture of the refrigeration unit recommended for the particular home. Beneath this the salesman fills in figures showing original, operating, and repair costs of the new unit based on experience of the company, together with a conserv-

ative estimate of the total annual savings to be realized by the customer through switching to the gas refrigeration unit. The back page of the folder is reserved for a summary of the "Results of the Survey," as applying to the particular home. This is properly signed by the salesman and manager and a copy left with the prospect or customer.

Supplementing the trailer demonstration method DuLaney's put on a cooperative sales campaign during May, June and July, participating in the New York World's Fair contest staged by Hales-Mullaly, Inc., Oklahoma distributors of gas appliances and equipment. To maintain interest in its own sales force, after it became known late in June who in its organization would win the Hales-Mullaly free trip to the fair, the DuLaney firm offered a free World's Fair trip of its own to another salesman in its own organization who would make or exceed the quota during July. This kept sales efforts up to a high pitch during a month when usually it is difficult to maintain sales enthusiasm.

Sales Manager Schultz revealed that DuLaney's maintain a year-around effort to sell gas refrigerators, and therefore keep such units on the trailers every month of the year. However, the company intensifies its efforts in the fall and winter to push the sale of other gas appliances, and radios.

The company has planned a special campaign which began September 1, to sell gas ranges, gas water heaters, floor furnaces and space heaters. This campaign opened with a barrage of radio and newspaper advertising. Then from September 11 to 16, a home service demonstrator, furnished jointly by Chambers ranges and Hales-Mullaly, put on daily cooking demonstrations in the all-gas kitchen of DuLaney's main store. Ladies attending were served with a buffet luncheon, including steak, ham, bread, butter and coffee. Following the cooking demonstrations, the home service expert accompanied the trailer salesmen to make demonstrations in the homes and assist DuLaney's present or prospective customers in other ways.

■ ■

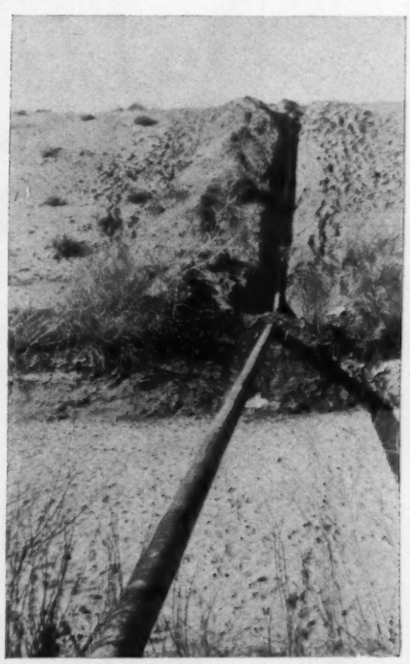
Charles City Company Sold To Iowa Public Service

Approval was recently given by the SEC for the purchase of the Central Iowa Utilities Co. at Charles City, Iowa, by the Iowa Public Service Co., it was announced by H. M. Smith of Waterloo, Iowa, district manager. It is expected that the gas company headquarters will be moved to the new Iowa Public Service Co.'s office. The Central Iowa company was a subsidiary of the American Utilities Service Corp.

Cleaning and priming the pipe used for the construction of New Mexico Gas Co.'s 30-mile line from Albuquerque to Belen.

New Mexico Gas Company's New 30-Mile Line To Bring Service to Three Communities

NATURAL gas will soon be served for the first time in Los Lunas, Ysletta and Belen, N. M., through a 30-mile, 5½-in., all-welded pipe line being constructed from Albuquerque to Belen by the New Mexico Gas Co., Santa Fe, a unit of the Southern Union Gas System. The line will be connected at Albuquerque with the company's 200-mile, 10- and 12-in., main line that serves Albuquerque and Santa Fe and originates in San Juan County, N. M. It is estimated that the new line and distribution systems, which will serve approximately 600 customers in the three towns, will be completed about February 10. Construction was started on January 7.



Crossing an irrigation ditch on the New Mexico Gas Co.'s line to Belen.

The pipe line is being coated with 3/16-in. Barrett hot coat enamel, and wrapped with Johns Manville asbestos felt and Kraft paper. National Tube pipe is being used. The line and distribution systems are being constructed by the Fredell Construction Co. of Houston and Denver at an approximate cost of $250,000.

A small building of New Mexico-Spanish architecture has been erected in Belen to serve as office and warehouse. It is anticipated that gas will be served to the Santa Fe railway shops at Belen.

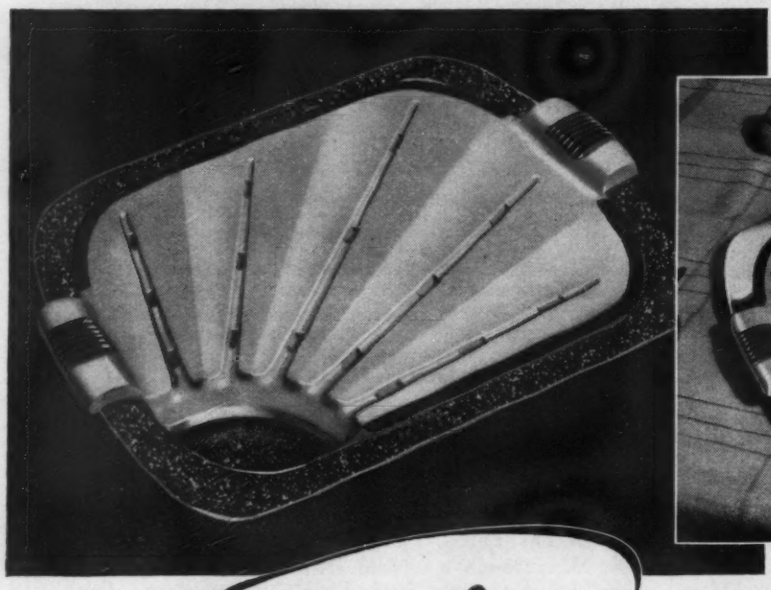
Nine miles of the New Mexico company's line will be looped with 8-in. pipe in the vicinity of Farmington, N. M., to provide facilities for serving additional customers in this territory. Last October the company increased the compressor plant capacity of the Farmington station from 400 hp. to 800 hp. and built a dehydration unit.

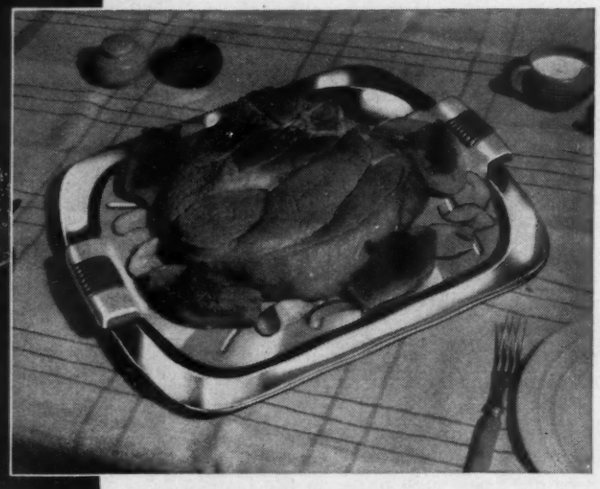
As soon as the Albuquerque-Belen line is completed, the New Mexico Eastern Gas Co., another division of Southern Union, will construct a 20-mile line from the main line south of Carlsbad to the Potash Co. of America mine and refinery east of Carlsbad.

Another Ride Ahead

PERFORMANCE FEATURES GALORE

★ ★ ★ ★





New . . . "PEASANT-WARE SERV-A-GRID" BROILER

● This sensational new feature is the greatest broiling improvement in years. Consists of sparkling enameled broiling pan, pottery grill made of "Peasant-Ware," and chrome tray to receive hot grill from broiler for distinctive table service. It's destined for instant popularity with homemakers everywhere....

and many other innovations by ROPER

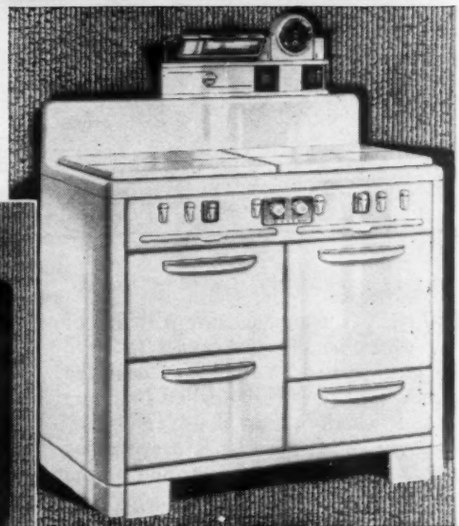
New . . . STAGGERED BURNER TOP

An exclusive Roper refinement. Burners positioned as shown. There's plenty of room for 4 extra-capacity utensils. No singed wrists. No hot utensil handles. No reaching over or around. The Staggered Top is the finest top burner arrangement in existence. It's a sure-fire sales builder.

with ROPER GAS RANGES in 1940

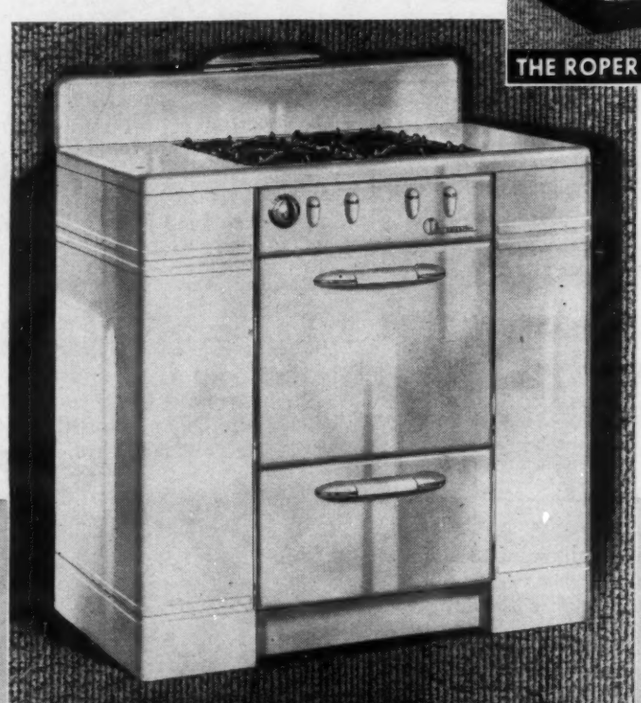
THE NEW PROFIT LINE THAT MEETS POPULAR MARKETS

- *NEW STYLES*
- *NEW VALUES*
- *NEW PERFORMANCE*
- *MORE MODELS*



THE ROPER "WALDORF"

THE ROPER "HAMILTON"



THE ROPER "TIPTON"

Ride ahead with the complete 1940 line of smartly styled Roper gas ranges for every conceivable situation. Among many models you find the small "Hamilton," the 36 inch "Tipton," the large double oven "Waldorf" with six or eight top burners—plus a long list of others. *Cp* galore! Values that can not be equalled. Throughout is reflected Roper's 55 years as the manufacturer of "America's Finest Gas Ranges."

Write today for new 1940 catalog and promotion book. Ride ahead with the profit line that has customer preference.

CERTIFIED PERFORMANCE **Cp** *for Cooking Perfection*

LET GAS DO THE 4 BIG JOBS

GEO. D. ROPER CORPORATION

GENERAL SALES OFFICE AND PLANT: ROCKFORD, ILLINOIS

Chicago: 343 So. Dearborn Street; Atlanta: 901 William Oliver Building; Los Angeles: 2481 Porter Street; Philadelphia: 401 N. Broad Street; Newark: 110 Edison Street; Dallas: Santa Fe Bldg., Second Unit; Cincinnati: 626 Broadway; Oakland: 500 Kirkham Street; Cleveland: 2053 East 105th Street; Kansas City; Boston; Washington; Roanoke; Pittsburgh.

ROPER GAS RANGES ARE IDEAL FOR USE WITH ANY TYPE OF GAS, INCLUDING BOTTLED GAS

SALES Slants

HOW TO GET RID OF A CUSTOMER

WHEN a man asks for a drink of water he doesn't expect to have the hose turned on him. Nor does the person who likes to be called by name — and which of us doesn't? — particularly relish hearing it every other word. As a matter of fact, one of the

surest ways to send even the most patient of prospects screaming for the exit is to keep repeating her name over and over again like a cracked phonograph record. *You probably will not offend a customer by finding out her name and using it in moderation, but the salesmen who are really artists at getting rid of customers are those who begin and end every sentence with the prospect's name, and repeat it a half a dozen times between periods.*

THE average woman doesn't know a B.t.u. from a syzygy and probably cares about it less. The thing she is interested in is what a given appliance can do for her: Does it give her better baking results? Does it afford more hot water for her family at less cost? Does it provide adequate refrigeration? Will it furnish ample heat for her home? Performance is a thing she can understand. The number of B.t.u.'s an appliance can deliver or what sort of material is used for insulation doesn't mean a thing to her. *So be sure to make your sales presentation good and technical if you want to drive prospects away from your door.*

THE salesmen who seem to be the most successful at getting rid of customers are those who never stop talking. If you never give a prospect time to think, it's pretty obvious she will never have an opportunity to make

up her mind. She might want to ask a question or two, or she might just want to stand and admire the beauty of the appliance she is contemplating buying. It's up to you, therefore, to keep her from doing either of these two things. Talk, talk, talk and keep on talking! *An unbroken monologue is pretty certain to kill a sale.*

A prospect naturally likes to have her needs and desires considered. She probably has a pretty good idea what she wants before you approach her. She will be displeased and irritated if you ignore that fact and try to keep her concentrated on a piece of merchandise she doesn't want. If she comes in to look at a water heater, try to sell her a gas range; if she is interested in gas ranges, insist on show-

ing her your line of refrigerators. And to make yourself thoroughly obnoxious keep her away from models which seem to attract her attention. *A good way to keep from selling people is to ignore their needs and desires.*

THE thing for which the customer is waiting is for you to ask her to buy. She may not expect you to ask it right off the bat, nor possibly does she anticipate your making the request

until she has signified her need and indicated that her mind is made up. But when she comes to that point, she looks for you to suggest buying. Thus there is no surer way of wrecking a deal and sending the customer away mad and confused than by refusing to come down to the matter of the dotted line. *You'll never make a sale if you never ask a customer to buy.*

★ Now Showing

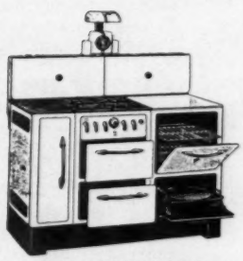
THE COMPLETE LINE ON FULL DISPLAY

De Luxe Model 4085C

De Luxe Model 4285C

De Luxe Model 4685C

De Luxe Model 4385C



De Luxe Model 4122CBK
Model 4124CB with Built-In Gas Circulating Heater

De Luxe MODELS

•

Compact MODELS

1940 WEDGEWOOD *Gas Ranges*

De Luxe Model 4022CBK

De Luxe Model 4024CBK

De Luxe Model 845GBK

36" Model 5085

36" Model 5185

36" Model 5285

36" Model 5022

Wedgewood Ranges are adapted for all types of gas, including bottled gas.

•

Gas THE MODERN FUEL

Wedgewood's complete line of 1940 CP Gas Ranges offers a wide choice from a varied selection of popular sizes and exclusive features. Superlative styling, construction and performance make WEDGEWOOD, again, the truly outstanding favorite.

ALWAYS WEDGEWOOD QUALITY—MAKES FRIENDS FOR GAS

JAMES GRAHAM MANUFACTURING CO. • LOS ANGELES • SAN FRANCISCO • NEWARK, CALIF. • PORTLAND, ORE.

INDUSTRY *Personalities*

Dr. John Wellington Finch, director of the Bureau of Mines since 1934, has announced his resignation from this position, effective Jan. 31, for the purpose of resuming his practice as a mining engineer. It is expected that **Edward B. Swanson,** associate director of the Petroleum Conservation Division, will be named Bureau of Mines director.

James F. Donnelly, sales manager of the Bastian-Morley Co., La Porte, Inc., has accepted the chairmanship of the sales promotion committee of the Gas Water Heater Division of the Association of Gas Appliance and Equipment Manufacturers, which will plan nation-wide sales promotion in behalf of automatic gas water heaters during 1940. The appointment was announced by Frank H. Adams, president of the Association.

Clifford E. Paige, president of the Brooklyn Union Gas Co., Brooklyn, N. Y., was elected second vice president of the Electrical and Gas Association of New York, Inc., at its annual meeting in New York on Jan. 17.

Charles D. Reichel, executive in the service department of the Cincinnati (Ohio) Group of Columbia System utilities, was recently honored by his colleagues on his 50th anniversary of service with the company. Since 1928 he has been supervisor of field service.

Ralph Ely, street department foreman for the Fort Worth, Texas, division of Lone Star Gas Co., has been appointed assistant industrial engineer and house heating engineer, according to an announcement by F. L. Carmichall, division manager. He will work with **Frank Jackson,** industrial engineer, and **Vernon Brown,** house heating engineer.

K. S. Kuykendall, formerly a fitter for Community Natural Gas Co. at Hillsboro, Texas, has been appointed sub-district manager for the company at Hubbard, Texas, it has been announced by L. B. Denning, Jr., vice president and operating manager.

Bernard P. Carey has been appointed general counsel in charge of the legal department of the Philadelphia Electric Co., according to Horace P. Liversidge, president of the company. Mr. Carey entered the employ of the company as a clerk in 1913 and joined the legal department in 1928.

Thomas Stanton, pressure foreman of gas distribution of the Cincinnati Group, was also recognized recently as having been in the company's service longer than any other employe. He started work at the age of 10 as an office boy, and on March 14 of this year will celebrate his 55th company anniversary.

Lowell S. Lockhart, formerly in the purchasing department of the Dallas Gas Co., has been transferred to the accoounting department, where he will be in charge of the general stores and merchandise stock ledgers, according to an announcement by C. C. Kiser, treasurer of the company. **Clarence W. Hahn** has been transferred from the main warehouse to assist in the work formerly done by Mr. Lockhart in the purchasing department.

W. Alton Jones, first vice president of Cities Service Co., New York City, was recently elected president of the company to succeed Henry L. Doherty, who died December 26 in Philadelphia.

W. ALTON JONES

Mr. Jones began his career with the company in 1912 as cashier of the Webb City and Carterville Gas Co., which later became The Gas Service Co., one of the Cities Service subsidiaries. In 1920 he went to New York as office manager and two years later was elected a member of the board of directors. Later, Mr. Doherty appointed him chairman of the executive committee of Henry L. Doherty and Co., and in 1927 he was elected first vice president of Cities Service Co.

B. W. Perkins, formerly at Carnegie, Okla., with the State Fuel Supply Co., has been transferred to Laverne, Okla., where he will be manager of the company's local office, replacing **R. B. Graves.** Before his three-year term at Carnegie, Mr. Perkins served the company two years at Wewoka.

W. B. Petch, formerly a salesman for the Ohio Fuel Gas Co. at Elyria, Ohio, has been transferred to the company's Medina, Ohio, office, where his territory will include the town of Medina and the northern part of Medina county. **Lloyd Fisher** will work in the southern half of the county and the northern part of Wayne county.

R. R. Van Horn, vice president of Luzerne County Gas & Electric Corp at Kingston, Pa., since 1929, has been elected to the presidency of his company. He succeeds A. J. Llewellyn, who retired Dec 31 on account of ill health.

John Pernise, helper at the Brooklyn Union Gas Co.'s Holder Division, Scholes Street Station, Brooklyn, N. Y., has recently returned from a 10,000-mile trip in a 36-ft. yawl across the Atlantic Ocean to the Mediterranean and back again to Sheepshead Bay. Mr. Pernise has been with the company for 10 years.

Col. A. L. Bishop has succeeded the late **Thomas Bradshaw,** who died Nov. 10, as president of the Consumers Gas Co., of Toronto. Col. Bishop has been a director of the company for the past year. **E. J. Tucker,** for three years general manager of the company, was elected to fill Mr. Bradshaw's place on the board.

SEMET-SOLVAY
ENGINEERING CORPORATION

Blue Gas Plants — Gas Purifiers
Water Gas Machines — Condensers
Washer Coolers — Waste Heat Boilers
Naphthalene Scrubbers — Producer Gas Plants

40 RECTOR STREET, NEW YORK, N. Y.

Mueller Flor-Aire Gas Furnaces for Small Homes give you an edge on competition . . . there's more to sell.

L. J. MUELLER
FURNACE COMPANY
MILWAUKEE

Fred H. Sargent was honored at a November banquet by 350 employes of the Lawrence (Mass.) Gas & Electric Co. when tribute was paid him for his 50 years of service as president and agent of his company. Mr. Sargent was presented with a diamond-studded 50-year service pin and a guest book containing the names of all present at the banquet.

John D. Kerrins, who has been associated with the Sprague Meter Co. at Bridgeport, Conn., for the past 22 years as supervisor of production and cost, was appointed assistant general manager of the company on Jan. 22, according to an announcement by E. L. Ballou, supervisor of sales.

J. D. KERRINS

Mr. Kerrins is considered an authority on meter leather tannage. He has been in charge of material experimentation and tests for a number of years. The Sprague Meter Co. manufactures gas meters.

T. H. Stephens, manager at East Liverpool, Ohio, for the Pittsburgh group of the Columbia System, recently completed 40 years of continuous service with the company. He is still actively engaged in managing the utility property and has not retired as was erroneously stated on page 56 of the November issue of *GAS*.

J. A. Hiller became sales manager for the Portland (Me.) Gas Light Co. on Dec. 26. Formerly he was manager of the Newton Division of the Boston Consolidated Gas Co., Boston, Mass.

A. E. Schwarz, formerly with the Bryant Heater Co., Cleveland, Ohio, has been appointed to the headquarters staff of Belnap & Thompson, Inc., Chicago, Ill., sales promotion agency. For the past 16 years Mr. Schwarz has been connected with sales promotion and advertising in the utility and manufacturing fields in New York, Minneapolis, and Cleveland.

L. E. Kirkpatrick, associated with the Ward Heater Co., Los Angeles, since 1936, has recently been appointed direct factory representative with headquarters at Denver, Colo.

L. E. KIRKPATRICK

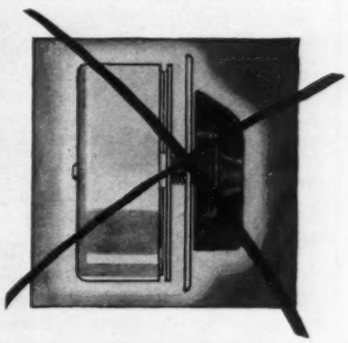
A native of Kansas, Mr. Kirkpatrick entered the gas industry in 1927 as a salesman for the Wichita (Kan.) Gas Co. Later he was associated with the United Power and Light Co. of Abilene, Kan.; Western Gas Co. of Salina; Argus Gas Co., Dodge City; Southern California Gas Co., Los Angeles, Calif., and the Central Arizona Light and Power Co. of Phoenix, Ariz. He is a member of the American Legion, having served in the Medical Corps during the World War.

Pembroke Touchstone, assistant chief clerk and bookkeeper in the Sinton, Texas, district office of United Gas Corp., has been transferred to Kenedy, where he will be manager of the company's office at that place.

Good FOR ALL TIME!

Today's housewife makes the timer on her range earn its own way. It gets a big play for everything from three-minute eggs to forty-minute cakes. It has to be accurate . . . it has to stand up and serve for the life of the stove with absolute dependability. That's where MARK-TIME leads again.

We can be wrong. Take our Model TX . . . it had a square-edged bell which housed the movement; it went "clunk" instead of having true bell-like resonance. It wasn't good enough! Quick to imitate us blindly, competitors followed us in this error . . . It is still being offered to buyers who may not know of MARK-TIME progress.

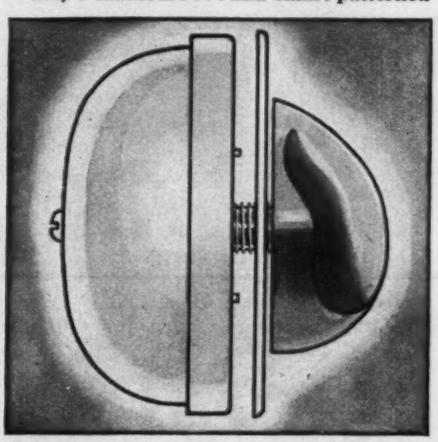


Now we've revolutionized all that. MARK-TIME Model ST is today's leader of the timer field. Here's what it gives you:

NEW RESILIENT ESCAPEMENT (protected by patent application), the first important improvement in that kind of mechanism in over 100 years. It's good for all time . . . takes hard knocks in factory, field, and home, and *won't* stall. It virtually eliminates servicing and rejections. It cuts the tick down to a whisper.

It gives you a PATENT-APPLIED-FOR COMBINATION of

CENTER STUD MOUNTING — quick, secure, requires no bothersome mounting plates and only one 3/8" hole. Allows 30-second installation by unskilled help.
PLUS "BELL-SHAPED" BELL — struck from inside; emits single, melodious, resonant note that carries throughout a home. Houses the movement.
PLUS PUSH-ON KNOB — designed to permit sure grip without damaging milady's manicure . . . and smart-patterned (design patented) escutcheon plate.



No other timer offers these MARK-TIME features. MARK-TIME leads again, and already many alert range manufacturers are giving us their best endorsement by specifying MARK-TIME *ST* for their new models. We're not surprised. We *should* be good. Timers are no side-line assembly job with us — they're our entire output, and we build them from start to finish.

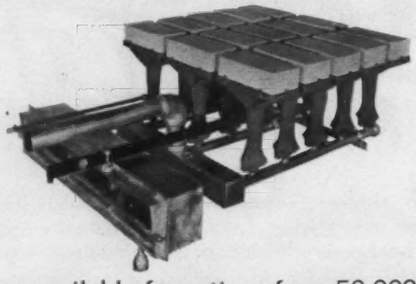
MARK-TIME TIMING DEVICES for Every Application

M. H. RHODES, INC. HARTFORD, CONN.

WECO–N. G. E.

SERIES F600

GAS BURNERS



These burners are available for ratings from 50,000 to 10,000,000 B.t.u. output, for use in heating boilers, power boilers — in any metal firebox or sectional boiler. Featuring flexibility to meet various firebox shapes and sizes at various gas pressures, and low draft loss. Full automatic controls that operate properly can easily be applied.

—GUARANTEED VIBRATIONLESS—

THE WEBSTER ENGINEERING COMPANY

TULSA *Division of* OKLAHOMA

SURFACE COMBUSTION CORP., Toledo, Ohio

F. J. Evans Engineering Co., Birmingham and Atlanta

Gas & Heating Specialty Co., Dallas Mechanical Equipment Co., Houston

Frank P. Fischer Engineering Co., New Orleans

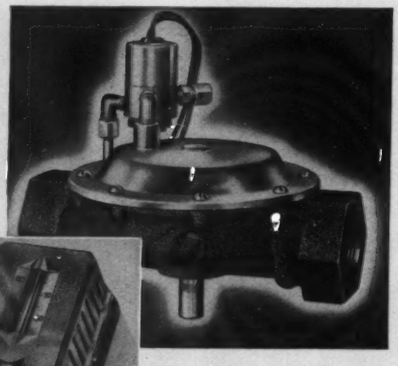
WHAT

KLIXON Control Sets

CAN DO FOR YOUR HEATERS

Klixon snap-acting control sets can do more than give you accurate room temperature control. They give you quiet control. You get no solenoid troubles. No humming or sticking. For the gas valves are thermally operated — and have an inherent time delay that prevents chattering during momentary power interruptions.

Klixon room thermostats — for use with Klixon gas valves — are vibrationproof and non-radio-interfering. Complete sets — including valves and thermostats — are available for all types of installation. Send for complete information.



KLIXON

SPENCER THERMOSTAT CO.

Attleboro, Mass.

GAS — 810 South Spring Street, Los Angeles, California

Yes! SEND ME GAS

for ☐ 3 Years at $2.00

SUBSCRIPTION RATES: United States, Canada, Mexico and Central American countries (in advance), three years $2.00; all other countries, $3.00 per year.

Name.....Position.....

Company.....

Address.....

City.....State.....

☐ Check enclosed ☐ Send bill

Karl Roeder, who for seven years has been manager of the Missouri Natural Gas Co. at Farmington, Mo., has resigned to become associated with the American Gas Machine Co., of Albert Lea, Minn. He will represent this company in the entire state of Iowa and the eastern half of Nebraska. He will be succeeded in Farmington by **Ernest Hammett,** who has been head service man for the company at Farmington for several years.

Harry L. Nickerson, engineer of manufacture, Brooklyn Union Gas Co., Brooklyn, N. Y., was recently appointed chief engineer by the company's board of directors. Prior to joining the Brooklyn company in 1925, Mr. Nickerson was first associated with the Peoples Gas Co. of Chicago, then joined the Boston Consolidated Gas Co. in 1907, where he remained as assistant superintendent until 1925, with the exception of three years which he spent with the New England Fuel and Transportation Co. He received his B.A. degree from Yale College, and studied chemistry at the Massachusetts Institute of Technology.

H. L. NICKERSON

Dr. C. M. A. Stine, vice president of E. I. du Pont de Nemours & Co., Wilmington, Del., was awarded, on January 12, the Perkin Medal. This medal is awarded annually by the American Section of the Society of Chemical Industry for outstanding services in applied chemistry. The committee of award comprises representatives of five leading chemical societies.

S. G. Eskin has been appointed director of the Robertshaw Research Laboratory in Pittsburgh, it was announced recently by the Robertshaw Thermostat Co., Youngwood, Pa. Mr. Eskin was formerly chief engineer of the American Thermometer Co., St. Louis, and prior to his recent appointment was research engineer of the Edison Electric Appliance Co., Chicago. He holds a B.S. degree from the Massachusetts Institute of Technology and an M.S. degree from Northwestern University.

George Mintner, for two and a half years associated with the A.G.A. Testing Laboratories, resigned December 30 to become associated with the engineering staff of the Cleveland Heater Co., Cleveland, Ohio. Mr. Mintner served in the Laboratories' research, testing and inspection departments. He is a graduate of Purdue University, with a mechanical engineering degree.

Ira L. Craig, manager of the rate and standard practice department of the Philadelphia Electric Co., Philadelphia, Pa., has been appointed chairman of the Rate Committee of the American Gas Association, according to an announcement by Walter C. Beckjord, president of the Association. Mr. Craig has been a member of the committee which he now heads for many years.

A graduate of Cornell University in 1908, with a degree of Mechanical Engineer, Mr. Craig began his utility career in the same year as assistant to the general superintendent of the Citizens Gas and Electric Co., Waterloo, Iowa. In 1913 he joined the American Gas Co., Philadelphia, Pa., and in 1928 was employed by the company he now serves.

Harry Kull, manager for the Missouri Gas & Electric Co. at Norborne, Mo., has been transferred to Richmond, Mo., his place being filled by **Charles Arehart. R. A. Cathcart** has been transferred from Richmond to Norborne.

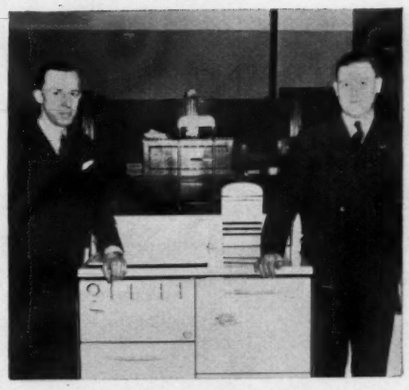
Don I. Devine has been made manager of the Van Wert, Ohio, office of the Associated Gas & Electric Co., according to an announcement by H. A. Armstrong, vice president and general manager of the western division. The new manager succeeds **Ralph F. Gibson,** who was manager for five years at Van Wert, but who has become gas division manager of the Tide Water Power Co. at Wilmington, N. C.

Richard W. Shank, superintendent of gas distribution at the Springfield office of the Central Illinois Light Co., has become vice chairman of the company's central safety committee in Springfield, succeeding **Clarence R. Wendt,** who has retired.

H. N. Ramsey, president of the Welsbach Co., Gloucester City, N. J., was elected vice-president of Gas Exhibits, Inc., at a meeting held in New York January 12, it has been announced by Hugh H. Cuthrell, president of the organization.

Mr. Ramsey is a director of the Association of Gas Appliance and Equipment Manufacturers as well as chairman of its general policy committee.

Gas Exhibits, Inc., is a non-profit, cooperative group of utility executives and manufacturers of the gas industry formed to plan and direct that industry's participation in the New York World's Fair.



Arwin Olson and Henry Heibing

First two CP Rangers from one company in the state of Wisconsin, is the record of **Arwin Olson,** left, and **Henry Heibing,** right, Wisconsin Public Service Corp., Sheboygan. Both men reached their total of 25 CP models during the Christmas season, Olson having completed his high point during a pre-holiday sales campaign, adding still further to it after the special sale had ended. Heibing came close to the record during the same period and crashed the select group shortly after. Both men have sold CP to approximately half of their customers. Of the total gas ranges sold during the late fall campaign in their community by the Wisconsin Public Service Corp., 29 models out of 98 sold were CP.

A. F. Rice, manager of market development for the Southern California Gas Co., Los Angeles, will leave that organization to take over the management of the Occidental Stove Co. of San Francisco, successors to Steiger & Kerr Stove & Foundry Co., effective on or about the first of March, it has been announced.

Mr. Rice has been associated with the Southern California Gas Co. since June, 1937, devoting his attention to trade activities. He also has been active since the inception of CP program as a member of the Domestic Range Committee, A. G. A., and as regional manager for national CP promotion in Arizona, Utah, Idaho, Nevada, British Columbia, Washington, Oregon, and California. He is chairman of the Pacific Coast Gas Association Sales and Advertising Section this year, and will continue in that capacity.

Prior to his gas company affiliation, Mr. Rice had been affiliated with the H. R. Basford Co. of San Francisco.

The Security Stove and Manufacturing Co., Kansas City, announces the following personnel changes:

Elected to the presidency last month was **W. T. Rasch,** who will also be in charge of sales promotion. Mr. Rasch was formerly president of the American Gas Products Division of the American Radiator & Standard Sanitary Corp. His son, **Lee W. Rasch,** formerly associated with the same company as his father, becomes engineer. Others to come from the same corporation are **Charles W. Hazelton** and **T. E. Grant,** who have joined the sales force.

G. W. Blakesley, who organized the Security Stove & Manufacturing Co. in 1906, is now chairman of the board of directors. **R. R. Cole, A. S. White** and **L. W. Millis** continue as vice president, assistant vice president and secretary-treasurer.

There is a JOHN ZINK BURNER For Every Purpose!

LOW PRESSURE BURNERS

For: DOMESTIC FURNACES
HEATING BOILERS
POWER BOILERS
DRILLING BOILERS
GASOLINE PLANT BOILERS

FLOOR FURNACES

Good GAS HEAT for COMFORT ECONOMY CONVENIENCE HEALTH

HIGH PRESSURE BURNERS

For: REFINERY STILLS
REFINERY BOILERS
POWER BOILERS
DRILLING BOILERS
GASOLINE PLANT BOILERS

STRAIGHTENING VANES

25,000 JOHN ZINK BURNERS IN USE — THEY MUST BE GOOD

JOHN ZINK BURNERS
4401 South Peoria Avenue
TULSA, OKLA.

JOHN ZINK BURNERS

TULSA, OKLAHOMA
342 Madison Avenue
NEW YORK, N. Y.

U. S. Bureau Will Compile Natural Gas Data in Census of Mines and Quarries

By ROSCOE WRIGHT
Chief of Public Relations, Bureau of the Census

THE progress that has been made in the field of natural gas since the days when, for want of a better use, our grandparents burned it in huge open torches, will be revealed by the Census of Mines and Quarries which the U. S. Census Bureau launched this month.

This will be the first complete census of natural gas producers in 20 years, a partial survey having been made in 1935. Annual production and value data have, of course, been collected by other agencies during this period and the present census is designed primarily to supplement such figures with other information of practical value that will provide benchmarks during the next decade.

Another activity of the Census Bureau in 1940 which will interest the gas industry is the biennial Census of Manufacturers, now under way. Every industry will be asked to report on quantity and cost of different types of fuel used during 1939. The resulting totals will present a significant picture of the industrial market for both natural and manufactured gas.

In 1937, the Manufacturers' Census shows, consumption of natural and manufactured gas by all industries totaled 2,825,829 in thousands of cubic feet. This represented a sharp rise from 1929 figures of 388,902,064 for natural gas and 512,831,454 for manufactured, the increase being nearly two trillion cubic feet, or 102.8%. The stone, clay and glass industry was by far the largest user of natural gas in 1929, while manufacturers of iron and steel and their products were the biggest consumers of manufactured gas. Total cost of both kinds of gas in 1929 was slightly more than 150 million dollars to industrial users.

The Manufacturers' Census also shows production of gas burners, boilers, furnaces, water heaters, cooking stoves, etc. In 1937, total output of burners, boiler-burner units and furnace-burner units using gas was approximately 118% greater than in 1935. The increase for gas cooking stoves and ranges was 44%.

The utility companies which manufacture gas are not being covered, because their operations are recorded by federal and state power commissions, and similarly, pipe lines are omitted from the census because information on them is obtained by the Federal Power Commission.

In the field of natural gas production, the current Census of Mines and Quarries will show to what extent the industry is related to the production of petroleum. Where once the marketed natural gas came almost entirely from the "dry" gas wells, it is estimated that today more than 40% comes to the surface in association with oil. Exact figures will be made available through the census, covering the output of both gas and oil.

To assure a complete picture of the industry as a source of employment, wages and markets, oil and gas producers have been asked to report all contractors who have done work for them during 1939, and these firms will also report their activities. Previous surveys have not reported in detail on this important segment of the industry.

Another phase of the 1940 census expected to produce new and valuable information is an inquiry on cost of drilling and equipping wells.

The capital goods market represented by natural gas producers will be measured by answers to a question on the amount spent for buildings, machinery and equipment erected or installed during 1939.

Complete information on employment and pay rolls will be obtained. The number and pay of workers operating or drilling wells will be determined, as distinguished from the figures for technical, supervisory and clerical help. Total man-hours worked in three classifications, operating gas wells, drilling wells and rig building, and other occupations, are also covered in the census inquiry. Employes of a central administrative office will also be reported.

The quantity and value of production will, of course, be obtained by the census.

Power equipment in use or available at gas wells on January 1, 1940, is to be listed, by number and total horsepower rating of each type. Cost of fuels, electric energy and materials will be reported as to quantity and value.

The reports of oil and gas well operators and contractors will be collected by mail. The reports from manufacturing establishments will be collected by census enumerators.

Fuel Check

In April, just about the time field work is being completed on these two inventories, the Population and Housing Censuses will be conducted. Findings of the latter will be of particular interest to the gas industry. Present plans call for a check on the principal fuels used for heating and cooking, and the principal heating and lighting equipment in all of America's estimated 33 million occupied dwelling units. The Housing Census was authorized at the last session of Congress.

The information to be obtained through these varied inquiries will be published in preliminary summary form by late summer or early fall, with detailed reports following as rapidly as possible. Prompt returns by the gas industry will facilitate early publication of the material in which it is most interested.

All persons and firms are required by law to report to the Census Bureau, but the same statute protects those giving the answers against disclosure of individual returns, or their use for taxation, investigation or regulation.

VENT-A-HOOD . . . sensational new patented kitchen ventilator—NOT A FAN—grease trap and centrifugal exhaust unit removes cooking odors from kitchen before they can invade other parts of the house. Prevents greasy vapors from settling on walls —saves housework. Keeps kitchen cool. Biggest innovation since mechanical refrigeration.

Factory representatives and warehouse stocks now in following cities. Other territory open.
Kansas City . . . . Ross Calkins, 1015 Mulberry
St. Louis . . . . Russell Patton, 526 Vanderventer
Chicago . . . Royal A. Stemm, 21 E. Van Buren
Pittsburgh, Pa. . . . T. C. Kersey, 2347 Manor Ave.

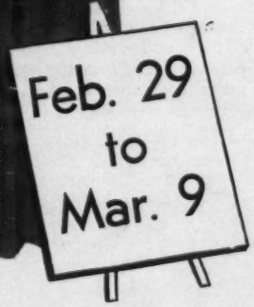
The VENT-A-HOOD Co.
2808 COMMERCE STREET
DALLAS Dept. L TEXAS

Preview of coming campaigns by P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

GAS APPLIANCE SOCIETY OF NORTHERN CALIFORNIA

1940 SPRING GAS RANGE CAMPAIGN



This year, as every year since 1935, the gas range industry in Northern California will put on a Spring Gas Range Campaign, offering a substantial price inducement to all those who buy during the campaign period from February 29 to March 9.

At this writing, the details of the campaign are not known, but it is a virtual certainty that there will be as much, if not more, advertising than there was last year when the campaign broke all previous records with 4896 unit sales.

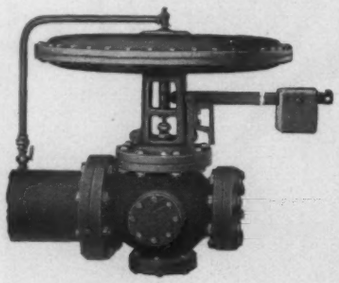
Also it is virtually assured that "CP" will be prominently featured in campaign advertising. And it deserves to be for having definitely raised the standard of quality and the average unit price, not only here but throughout the country.

Officially, the campaign will be announced on or about February 1 in a letter from the Gas Appliance Society. Watch for this letter and for the accompanying details and campaign rules and suggestions for tying in. When you've thoroughly read it, get busy!

G 202-240

DEALERS: By watching this page from month to month you can keep informed of sales promotional campaigns to be sponsored by the Pacific Gas and Electric Company and the Gas Appliance Society. Detailed information will be supplied, as usual, through the mail. If such information is not received, call our local office or write Gas Appliance Society, 1355 Market Street, San Francisco, California.

Easily Installed. Control Sure. Valve Seats Easily Replaced.



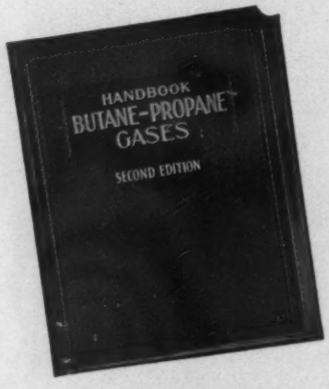
FULTON
Low-Pressure Regulator

Easy installation, easy replacement of valve seats when needed, and unfailing reduction of comparatively high pressures to suitable pressures for use—even very low pressures if required—are advantages of the Fulton Low-Pressure Regulator. Changes of pressure on the inlet side have no effect on delivered pressure, which is kept constant. When valve seats become worn, they can be replaced without disturbing the body of the regulator. Simple directions are furnished. Descriptive Bulletin No. 1150 will be mailed on request—also new catalog of Chaplin-Fulton regulators for all gas-control uses.

The CHAPLIN-FULTON MFG. CO.

28-40 PENN AVE. CF PITTSBURGH, PA.

HANDBOOK BUTANE-PROPANE GASES



415 Pages

CONTENTS: Semi-Bulk Distribution: Use of Butane in Buses: Combination Propane Operated Utility Plant: Use in Internal Combustion Engines: Design & Installation of Storage: Supply from Petroleum Refineries: Engineering Data on the Lower Olefins: Domestic Appliance Testing and Utilization: Economical Comparisons with Coal, Oil, Electricity, Producer Gas, Manufactured Gas: Town Plants: Manufacture from Natural Gas: Special Uses: Volume Correction Factors: Transportation: Use with other Gases: Analysis & Testing: Properties of Mixtures: Bottled Gas Distribution: Bibliography: Central Plant Directory: Catalog Section.

SECOND EDITION (Revised November, 1938) **$5.00** *Plus Postage*

We pay the postage on orders accompanied by remittance

Published by Western Business Papers, Inc., publishers of

GAS
The NATIONAL Gas Magazine

BUTANE-PROPANE News
810 S. SPRING ST.
Los Angeles, Calif.

Commercial Standards for Pipe Nipples Recommended

ON recommendation of the National Association of Pipe Nipple Manufacturers, and with the endorsement of the standing committee, the Division of Trade Standards, U. S. Dept. of Commerce, National Bureau of Standards, is sending a recommended commercial standard for pipe nipples: brass, steel and wrought iron (revision and consolidation of CS5-29, CS6-31 and CS10-29), to producers, distributors and users of pipe nipples, for their written acceptance prior to publication of this standard by the National Bureau of Standards.

Interested organizations not producing, distributing or using pipe nipples may obtain this standard and indicate their approval by signing an acceptance form and adding the words "in principle" after the signature.

This standard is a basis for common understanding between manufacturers, distributors and users of pipe nipples. Through the certification of quality according to the requirements of this standard, it is hoped to safeguard the user and place competition on a fair basis, to the mutual advantage of all concerned.

It covers steel and wrought iron pipe nipples, black and zinc coated (galvanized), in iron pipe sizes from ⅛ to 12 in., inclusive, of standard lengths; and brass nipples in iron pipe sizes from ⅛ to 6 in., inclusive, of standard lengths.

Specifications are given for the materials from which the nipples are made, their size, the type and size of threads, packaging, standard assortments in cartons, and labeling of the cartons.

■ ■

T. R. Thompson, Lone Star Advertising Man, Passes

Thomas R. Thompson, assistant to Will C. Grant, advertising director of the Lone Star Gas Co., and World War veteran, died in Dallas, Texas, January 25, at the age of 41.

Mr. Thompson was born in Springfield, Mo., in 1898, and joined the regular army when he was 16 to serve with General Pershing's punitive expedition along the Mexican border. He accompanied the A. E. F. to France in 1917, where he won a commission as second lieutenant, the commission being granted by special order because he was under 21 years of age. He joined the advertising staff of the Lone Star Gas Co. about 10 years ago.

■ ■

A. G. A. Committee Report Prepared by M. H. Clark

A cooling system which is particularly favorable to utilization of waste heat from gas engines is described in the A.G.A.'s Gas Engine, Power Committee's report "Waste Heat Utilization," which was prepared by Manley H. Clark, power engineer, Southern Counties Gas Co., Los Angeles, Calif., and presented before the American Gas Association annual convention, October 9-12. An abstract of this report was published in the November issue of GAS, page 31, without crediting Mr. Clark.

■ ■

D. S. Howard of Tulsa Dies

D. S. Howard, 52, for many years active in the natural gas industry in Oklahoma, died recently in Tulsa following a brief illness. Mr. Howard organized and headed the Muskogee Natural Gas Co., and also organized a natural gas company in Ardmore, Okla.

Wisconsin Utilities Plan Annual Meeting in March

THE Gas Section of the Wisconsin Utilities Association will hold its annual convention March 11 and 12 at the Pfister Hotel, Milwaukee, Wis. At the same time will be held the Home Show in Milwaukee, where new household appliances will be displayed.

The program as planned includes one entire day devoted to combination sessions of the Technical and Commercial Divisions, at which, instead of set speeches, there will be demonstrations in skit and quiz form. Sales representatives of manufacturing companies and utilities, home service directors and engineers will take part in these demonstrations.

The second day of the convention will be devoted to discussion forums, where personalized treatment will be given to the problems of the different companies, and reports of the studies undertaken by committees of the Technical Division. There will also be a report on the safety measures adopted by companies for the protection of employes and the public. G. A. Anderson, chairman of the Technical Division, and L. A. Dubberke, chairman of the Commercial Division, are working on details of the convention program.

■ ■

Prize Book Offered as Incentive to Salesmen

"Make Selling Your Hobby" is the theme of the new 1940 prize book, or "Push Book," released by Belnap and Thompson, sales promotion agency, Chicago, Ill.

This prize book, which is illustrated with nearly 1000 prizes, is sent to salesmen in sales contests in order to allow winning contestants to select their own prizes. In addition to the illustrated prizes, grouped according to hobbies, there are articles on selling by Elmer K. Wheeler, author of *Tested Selling Sentences;* R. C. Borden, author of *Borden and Busse;* Edgar A. Guest; William Hazlett Upson, author of the *Earthworm Tractor* series; and Lionel B. Moses, *American Weekly.*

Sample copies of the book may be secured from Belnap and Thompson, Inc., 313 West Jackson Blvd., Chicago.

■ ■

Southern Counties Gas Co. Gives Annual Sales Dinner

The twenty-ninth annual sales dinner of the Southern Counties Gas Co., Los Angeles, was held Jan. 17 in the company's general offices. It celebrated "a very satisfactory year in the sale of load-building gas appliances, a year which showed a substantial increase over the previous 12-month period not only in units but in monetary value." Sales totalled $969,757.

Speakers on the program were Clyde H. Potter, commercial manager, Southern Counties Gas Co.; F. S. Wade, president of Southern California Gas Co.; A. F. Bridge, vice president and general manager, and Norman R. McKee, vice president of Southern Counties Gas Co.

■ ■

Recycling Plant Planned

Plans for the construction of a natural gasoline recycling plant three miles southwest of Grapeland, Texas, have been announced recently by the Grapeland Oil Co. The company has drilled one distillate well on its 325-acre block and plans to drill two additional wells. This is the third recycling plant in the Grapeland area.

MUELLER GAS DISTRIBUTION EQUIPMENT

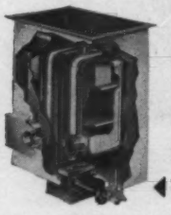
The time-tested Mueller line includes Mueller Evenflow Service Regulators, Gas Stops, Service Stops, Stove Stops, Drilling and Tapping Machines, service boxes, meter trims and similar equipment. Write for description and prices.

MUELLER CO., Los Angeles, Calif.

Factories: Decatur, Ill.; Chattanooga, Tenn.; Los Angeles, Calif.; Sarnia, Ont.
Branches: New York and San Francisco

Payne SELLS GAS!

When you sell a Payne Furnace you sign up a satisfied gas consumer for life! A quarter of a century devoted exclusively to precision construction and engineered design of gas fired appliances means carefree heating for the user, a *permanent gas load for you.*



The Payne Floor Furnace

There is a Payne Gas Furnace for every heating need

FLOOR FURNACES • FORCED AIR UNITS
CONSOLES • WINTER AIR CONDITIONERS
DUPLEX FURNACES • GRAVITY FURNACES

Write for information

PAYNE Furnace & Supply Co., Inc.
BEVERLY HILLS, CALIFORNIA

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COMBINATION GAS CONTROL
Provides
COMPLETE SAFETY
FOR ALL FUEL GASES

For Additional Information Write
MILWAUKEE GAS SPECIALTY COMPANY
MILWAUKEE - WISCONSIN

CURRENT *Reading*

Profits for Tomorrow — An analysis of trends in gas refrigeration has been issued in book form by the American Gas Association Refrigeration Committee, Bernard T. Franck, chairman. The 24-page booklet is a factual presentation for gas company executives to assist them in setting up their 1940 refrigeration sales plans. The material presented covers trends over the past 12 years.

The book discusses the desirability of a continuous year-round selling campaign for gas refrigeration. To dramatize the Committee's analyses, 10 pages of charts, each accompanied by an explanatory page, are included. Gross and net revenue, daily and yearly gas consumption, determining factors in refrigerator purchaser's preferences, the potential in the replacement market and a 10-year prospectus for refrigerator sales are subjects of some of the graphs.

Line-Pipe Specifications — Supplement No. 6 to API Standards No. 5-L, gives effect to changes and additions adopted at the 1939 Mid-Year meeting, including revisions in coupling dimensions, vanish angle on pipe and in couplings, and corresponding changes in thread dimensions.

Phase Retrograde Phenomena of Hydrocarbon Mixtures in Condensate Production—A. L. Vitter, Jr. *Oil and Gas Journal,* Oct. 19, 1939, pp. 48-50, 60. A graphic presentation of data which explain the possibilities and limitations of retrograde condensation is included in this article. In these, the relationship of pressure and temperature to liquid recovery within a butane-propane system is revealed in accordance with experimental data derived in several recognized laboratories.

Polymerization of Hydrocarbons Present in Natural Gas—Rafael Fussteig. *Petroleum Engineer,* Oct. 1939, pp. 219-223. One source of raw material for polymerization is natural gas. The pyrolysis of gaseous paraffinic hydrocarbons has been investigated from various viewpoints by many investigators. The conversion of gaseous paraffins into liquid polymerization products takes place in two steps. By using proper temperatures and contact times, the pyrolysis and the polymerization can be conducted as separate operations, or combined. The choice of method depends upon the types of gas, the cost of equipment, and the production cost. The methods are described in detail and are illustrated by diagrammatic sketches.

Wrought Iron: Its Manufacture, Characteristics and Applications (second edition)—James Aston and Edward B. Story, consulting metallurgist and chief metallurgist, respectively, of A. M. Byers Co., Pittsburgh, Pa. This 97-page, cloth bound book has been issued by A. M. Byers Co. in response to a growing need for information on the qualities of materials and their application to present-day problems in connection with a rapidly growing demand for wrought iron in many different products. Included are chapters on the uses and development of wrought iron processes and manufacture from primitive times to 1850 as compared with present-day methods; quality standards; specifications and durability testing; characteristics; forging, bending and welding of wrought iron; principal applications, and glossary of terms relating to wrought iron manufacture and products.

Gas Welds in Heavy-Wall Pipe—M. R. Scott. *Power,* Oct., 1939, pp. 86-89. For gas welding heavy wall industrial piping, a new technique, known as single flame multi-layer, has distinct advantages over previously used methods. The process is not only economical and easily mastered by average operators but produces welds of sound quality and high ductility which readily fulfill code requirements. The two general methods at present used in the oxy-acetylene welding of pipe are (1) neutral flame forehand technique and (2) backhand welding with an excess acetylene flame. The new technique might be described as a combination of these two, employing the neutral flame of the former with the backhand technique of the latter. Also in *Heating, Piping and Air Conditioning,* Oct., 1939.

Mirror Finishes and Ring Coatings Improve Engine Lubrication—M. G. Van Voorhis. *National Petroleum News,* Oct. 4, 1939, pp. R414, 415, 417. Removal of surface imperfections on bearing surfaces and engine cylinder walls reduces wear and enables considerable increase in bearing loads. Piston ring coatings prevent "welding action" under high local pressure and temperature conditions and serve, in some instances, as polishers with temporary mild abrasive action during the first few months of service of motor cars. Mirror-like bearing surfaces are produced in a factory oil film rupture. These developments have no influence upon lubricating oil specifications nor upon further research in any phase of improving lubricating oils.

Engine Flame Researches—T. A. Boyd. *S. A. E. Journal,* Oct., 1939, pp. 421-432. Calling knock "the cancer of engine combustion," the author explains that his paper—a review of research on engine combustion which has been pursued steadily for many years—is concerned chiefly with this phenomenon. He describes an optical engine indicator by means of which it was observed early that knock is not caused by preignition, as was then thought, but that it arises from a pressure disturbance which occurs several degrees after the ignition spark; the bouncing-pin indicator for matching fuels or for comparing one degree of knock with another; auxiliary sampling valves for tracing reaction progress by chemical means and for detecting incipient oxidation within the dark

region ahead of the flame; windows of various sizes and shapes through which events inside the combustion space were observed by eye, photographed in sections and in full view, and examined with the aid of the spectroscope. Through such windows also radiation from the flames was registered by a thermopile, and flame temperatures were measured by a spectographic technique.

Industrial Hazard of Static Electricity — By Harold Joe Davis, safety engineer, 3927 E. Admiral Place, Tulsa, Okla. Pamphlet, privately published by author. Presents some of the electrostatic hazards encountered in industry and gives suggestions for overcoming them. Sets out that static electricity is generated not only by friction but by bringing together or separating unlike substances in many industrial operations, and shows that under most conditions static electricity in industry can be successfully controlled, even if it is impossible to prevent its generation. Topic heads include ionization, humidification, belt dressings, grounding and bonding, spray gun painting, explosions and the human body.

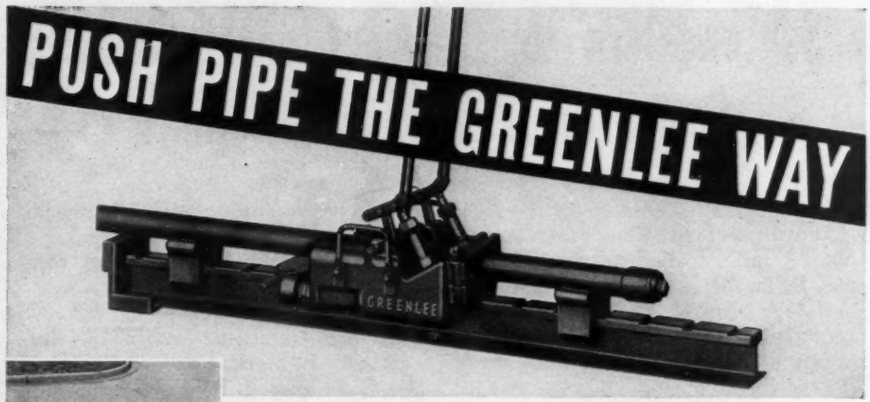
Phase Equilibria in Hydrocarbon Systems — Joule-Thomson Coefficients of Gaseous Mixtures of Methane and Ethane—R. A. Budenholzer, B. H. Sage, and W. N. Lacey. *Industrial Engineering Chemistry*, Oct., 1939, pp. 1288-1292. Joule-Thomson coefficients for three mixtures of methane and ethane were determined experimentally at pressures from 40 to 1500 lbs. per sq. in. absolute at four temperatures between 70° and 220° F. From these and other published data the isobaric heat capacity of the mixtures under these conditions was calculated. The experimental and calculated results are presented in tabular form.

Control Equipment for High Pressure Oil and Gas Wells—Herbert Allen. *Mechanical Engineering*, Oct., 1939, pp. 725-728. This article describes some of the control equipment used in the Texas and Louisiana Gulf Coast region, with particular reference to well completions requiring equipment tested to 10,000 lbs. Flanged stacked casing heads have been used considerably of late; gate and plug valves have made tremendous strides in only the last year, as have materials and welding practices.

Natural Gas Conservation and Utilization (California) Studied from 1906 to Present — Roy M. Bauer. *California Oil World*, 2nd Nov. issue, 1939, pp. 7-12. A history of the use and conservation of natural gas, with graphs showing monthly production and utilization from 1929 to 1939, storage and withdrawal record of Buena Vista Hills field, and others.

Predicting Wet Gas Recovery in Recycling Operations — Judson S. Swearingen. *Oil Weekly*, Dec. 25, 1939, pp. 30, 32, 33, 36, 38. The discovery in recent years of a number of fields that yield a new type of petroleum production known to the industry as condensate or distillate, has created new operating problems. This article presents principles that should influence the selection of well locations and the plan for future operation in an important way if maximum recovery of liquid is to be realized.

Alignment Chart for Estimating the Mean Effective Pressure and Piston Speed of an Engine — Frank E. Hangs. *Petroleum Engineer*, Dec., 1939, p. 94.



Above is the Greenlee Hydraulic Pusher set up for pushing pipe under a paved street. One man, standing in a comfortable position, can exert a pressure of 40,000 pounds on the pipe clamp.

It's the Easy Way to Make Underground Installations

If you are using a pipe pusher that requires much manpower to operate it, you can save time and money by putting a Greenlee Hydraulic Pusher in operation. And if you are making underground installations by trenching, you can save still more. No longer is it necessary to tear up lawns and pavements.

With the Greenlee it is only necessary to make a trench long enough for the pusher and a section of pipe, and one man can send it where it is wanted, simply by pumping the handles. Different speeds are provided for varying soil conditions, and a push of from 4 to 7 feet can be made without changing the pipe clamp. This is because the power unit operates on a base, which can be furnished in different lengths. The range is for pipe up to 4-inch.

Ask NOW for complete information on this time and labor-saving tool!

GREENLEE *Hydraulic* PIPE PUSHER

GREENLEE TOOL CO., 1700 Columbia Ave., ROCKFORD, ILL.

MONO-CAST DOUBLEX SIMPLEX PIPE BEING INSTALLED IN CONNECTION WITH THE CHICAGO SUBWAY PROJECT

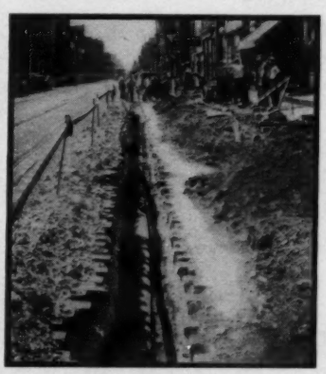


Photo shows 8" Mono-Cast Doublex Simplex Pipe being installed for gas service along Milwaukee Ave., Chicago, as part of the gas company's expansion program in connection with Chicago's gigantic subway project. The northwest branch of the subway is being constructed under this street. More than 7,000,000 feet of Mono-Cast Doublex Simplex Pipe are now giving highly satisfactory service in transmission of gas, oil, gasoline, water, etc., through the United States and in foreign countries. Write for literature.

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BIRMINGHAM, ALA.
DALLAS HOUSTON EL PASO NEW YORK CITY
PITTSBURGH CHICAGO KANSAS CITY CLEVELAND
MINNEAPOLIS LOS ANGELES SAN FRANCISCO

Southwestern Measurement Short Course Committee Plans April Meeting

THE general committee for the 1940 Southwestern Gas Measurement Short Course, to be held April 16, 17 and 18 in the College of Engineering building, Norman, Okla., met at Norman January 19 to arrange a tentative program and make other arrangements for the short course.

R. L. Rountree, United Gas Pipe Co., Dallas, Texas, chairman of the program committee, will present the program for final approval at a meeting of the general committee, March 4, in the Biltmore Hotel, Oklahoma City.

Other chairmen of committees arranging the 1940 short course are: W. H. Carson, dean, college of engineering, University of Oklahoma, Norman, local arrangements, banquet and entertainment; Earl Kightlinger, Arkansas-Louisiana Gas Co., Shreveport, La., exhibits; C. A. Gibson, Cities Service Gas Co., Bartlesville, publications; R. M. Scofield, Lone Star Gas Co., Dallas, study of practical methods; Kate A. Niblack, Oklahoma City, secretary, Oklahoma Utilities Association, registration and publicity.

Four new committee members, confirmed since the last short course, attended the meeting. These were: E. C. McAninch, Oklahoma Natural Gas Co., Tulsa; E. L. Stark, Foxboro Co., Dallas; C. E. Terrell, Southwestern Natural Gas Co., Birmingham, Ala.; W. H. Woods, Gulf Oil Corp., Houston, Texas.

Fay C. Walters, Panhandle Eastern Pipe Line Co., Kansas City, Mo., general chairman of the committee, presided during the morning session. R. L. Rountree presided at the afternoon session.

Assisting the college of engineering, University of Oklahoma, which sponsors the short course each year, are the following organizations: Corporation Commission of Oklahoma; Railroad Commission of Texas; Kansas Corporation Commission; Oklahoma Utilities Association; Natural Gas Section, American Gas Association, and Natural Gasoline Association of America.

Eighteen equipment companies have arranged thus far to have exhibits at the 1940 short course.

■ ■

Gas Holder Regulations Are Effective April 1

The California Railroad Commission has announced that its General Order No. 94, covering the operation, maintenance and inspection of gas holders, will become effective April 1, 1940.

This order was drafted by the commission's engineers with the cooperation of California gas companies working through an association committee under the chairmanship of A. F. Bridge, vice president and general manager, Southern Counties Gas Co., Los Angeles. This committee included Messrs. A. R. Bailey, R. S. Fuller, H. L. Masser and D. H. Perkins. The studies and discussions leading to the provisions of this order have occupied nearly two years. In general it prescribes a uniform procedure for the design, operation, maintenance and inspection of gas holders and hydrocarbon vessels built and operated by utilities in the state. Printed copies of the order will be available shortly at the commission's office. Also available will be sets of the inspection forms required by the order.

■ ■

Omaha Adds Excess-Gas Rate Clause to Contract

The Metropolitan Utilities District of Omaha, Neb., has recently added a supplement to its contract with the Northern Natural Gas Co., which allows the district to purchase the company's natural gas in excess of the four million cu. ft. maximum allowed under the contract, at a rate of 35 cents per M c.f. Under the existing contract, which is in effect until April 30 and thereafter until either party gives six months' notice, the Omaha district pays Northern Natural $30,000 per million cu. ft. of natural gas, or $120,000 for the maximum demand. Before the supplement was added to the contract, the district paid the company $30,000 for gas used in excess of the maximum.

The supplement, which will expire May 15, applies only when the Northern Natural company has an available surplus, and the use of the excess gas can be terminated by the gas company on two hours' notice.

■ ■

E. J. Hanlon, Safety Man For Peoples Gas Co., Dies

Edward J. Hanlon, supervisor of safety, Peoples Gas Light and Coke Co., Chicago, Ill., died December 24 in Chicago, following an illness of several weeks.

Mr. Hanlon had been employed by the company for nearly 29 years, 13 of which were in the safety department. At the time of his death he was a member of the accident prevention committee of the A.G.A., a member of the engineering committee of the Greater Chicago Safety Council, chairman of the engineering committee of the Public Utility Section of the National Safety Council, and immediate past commander of Peoples Gas Post, American Legion.

■ ■

Purcell Has New Gas Office

The Gas Service Co., whose headquarters are at Kansas City, Mo., has recently opened a new office in Purcell, Okla., on the first floor of the city hall, with Francis Hesse in charge.

BUTANE-PROPANE News

THE CLEARING HOUSE FOR NEWS AND INFORMATION ABOUT . . .

Transportation and Storage
Safety Practices
Industrial and Standby Uses
Bottled Gas Distribution
Semi-Bulk Distribution
Dealer Sales and Service
New Appliances and Equipment
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Etc., Etc., Etc., Etc.

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Sentence Contest Sponsored By Missouri Public Service

THE Missouri Public Service Co., Chillicothe, recently sponsored a sentence-writing contest for the public in which the contestants submitted sentences of 10 words or less by using the word GASper, the name given to the blue flame trademark adopted by public service companies. The last three letters of the word had to be used as the first three letters of the following word. Winning sentences were selected on the basis of their sales appeal.

Some of the best of the sentences in the three winning lists were:

"Quick meals with GASper motes a hungry man's contentment."

"GASper sents your problem solved — even temperature — home and husband."

"You'd do well to accept the heated home GASper poses."

"GASper dicts a mild winter if you take him in."

"GASper fects the efforts of the expert and the amateur."

"GASper suades the men by his low cost efficiency."

■ ■

Oklahoma Natural's Essay Contest Winners Selected

Winners in the essay contest sponsored by the Oklahoma Natural Gas Co., Tulsa, for Oklahoma newspaper men were announced at a meeting of the Oklahoma Press Association, January 20, in Oklahoma City. Answers to the question, "Where Ahead Lies Oklahoma's Greatest Opportunity and How Can We Attain It?" were submitted to the gas company by 117 state newspaper men.

First prize of $250 was won by Bob Kniseley, *News Publicist* of Chandler, and the second prize of $100 was awarded to Everett Purcell, Jr., *Enid Events*, Enid.

H. Vinton Potter, Oklahoma Natural Gas Co., spoke at the meeting.

■ ■

W. A. McGlashen Speaks at So. Calif. Meter Ass'n

The featured speaker at the Jan. 25 meeting of the Southern California Meter Association was W. A. McGlashen, whose subject was "Specific Gravity Instruments — Their Operation and Maintenance." The meeting was held in Huntington Park. Entertainment was sponsored by the Braun Corp.

The next meeting, to be held Feb. 24 at the Riverside Breakfast Club pavilion, will be the Association's annual Hi Jinks.

■ ■

New England Association Holds Divisions Meetings

The Operating Division of the New England Gas Association held its Production and Distribution sessions in Boston on Jan. 12, one in the morning and the other in the evening, with a 6 o'clock dinner intervening.

The Industrial Division meeting, commercial department, met on Jan. 26 at the University Club in Boston.

■ ■

Ohio Fuel Gas Franchise

The Ohio Fuel Gas Co. has accepted a new five-year franchise offered by Mt. Vernon to provide a continuation of gas service in that city. Present rates will continue for four years. In the fifth year the rate in the 5000-ft. block will be increased from 5 to 5½ cents per hundred.

PROFITS BEGIN IN '40

WITH

PHILGAS

PROPANE or BUTANE

Let 1940 mark the beginning of a new era of profit for you—by converting your water-gas or coal-gas plant to

PROPANE-AIR or BUTANE-AIR

Take advantage of this profit opportunity immediately. Fully experienced Philgas engineers will gladly discuss the conversion with you—with no obligation on your part. Phone or write Philgas today!

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GENERAL MOTORS BUILDING
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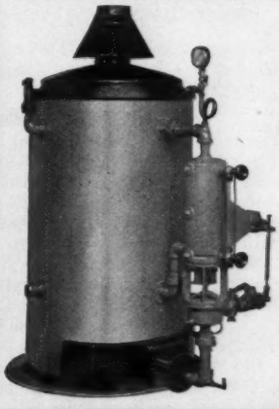

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Plain tubular . . . . . ¾ to 10 H.P.
Water Leg tubular . . 5 to 45 H.P.
HE Flueless . . . . . 1 to 18 H.P.

ASME Code for 100 lbs. S.W.P., also for higher pressures.
Non-electric Low Water Cut-offs for all types of boilers.

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by
FRASER

TUCK-A-WAY extra large radiating surface—Wall register—No Hot Floor Grill—Noise banishing ribs — No "burned out" air—No sweating.

DOUBLE WALL—same features as Tuck-a-Way—two wall registers for adjacent rooms.

CABINET FURNACE—sets in closet or service porch—Small space—heats every corner.

ALSO

P. A. C. —W. A. C. — BASEMENT and FLOOR FURNACES in many sizes.

CONSOLE HEATERS

It's the inside of the heater that counts—Sell Fraser for Customer Satisfaction.

H. B. Basford Co. Distributors San Francisco Los Angeles
Fraser Furnace Co. Manufacturers Stockton, California

FRASER
GAS HEATING EQUIPMENT

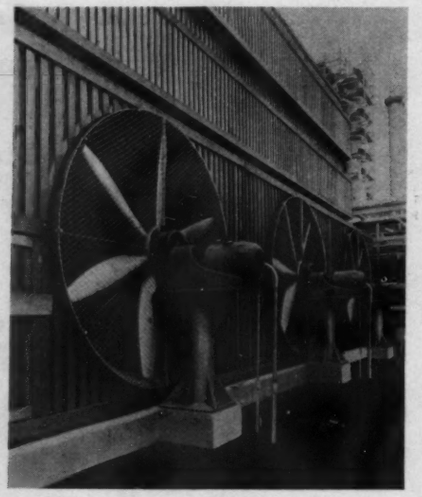
MODERN *Products*

Cooling Tower

The Fluor Corp., Ltd., 909 E. 59th St., Los Angeles, Calif.

Model: Fluor Forced Draft Cooling Tower.

Description: Tower has 10-foot aluminum alloy fans with adjustable pitch, and has fans that are pedestal-mounted and motor-driven through special gear reduction units. The exterior walls of the tower are of the new aerator type outer shell construction which provides ventilation for outside walls, preventing rot and eliminating unsightly, water-stained appearance. The complete tower is constructed of prefabricated California redwood, secured with brass bolts and hardware. Where space is not available for the installation of a Fluor Atmospheric Aerator Type



Cooling Tower, the Forced Draft units offer high cooling efficiency under comparable conditions. The overall size of the tower is 48 ft. long, 40 ft. deep and 28 ft. high. This unit has six cells, each measuring 20 ft. by 15 ft., and is rated to cool 5000 gals. of water per minute.

■ ■

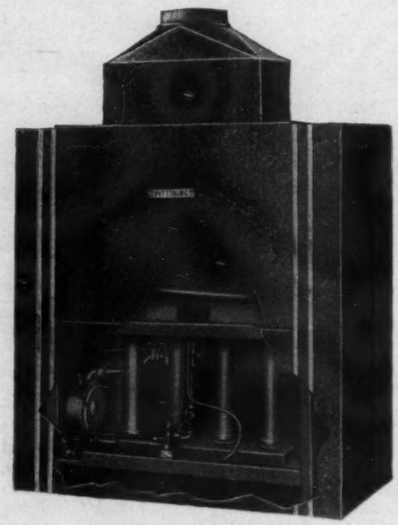
Humidifier

Autogas Corporation, 2258 Diversey Parkway, Chicago, Ill.

Model: Republic Humidifier.

Description: This humidifier may be installed in the basement of any home regardless of the type of heating plant, and may be supported upon a shelf or suspended from the basement ceiling. The cabinet is 8 in. deep, 15 in. wide and 25 in. high and has a two-tone crystalline finish, the body being a light gray and the door a light blue. The humidifier is equipped with an evaporator having a finned outer surface, a sludge pocket, and a removable burner assembly.

Model 750 is rated up to 7 gals. of water per day with 5000 B.t.u. per hour input, and Model 1180 up to 11 gals. per day with 8000 B.t.u. per hour input.



House Heater

Pittsburg Water Heater Corp., Pittsburgh, Pa.

Description: In this heating system only a few pints of water are used, resulting in the quick conversion of gas into available heat. In the average installation this amount of water circulates every three minutes. The heater is equipped with a simply-operated thermostat and a shut-off safety pilot. When the pilot light goes out, the flow of gas is automatically shut off. A blown fuse or power failure stops all flow of gas to the burner.

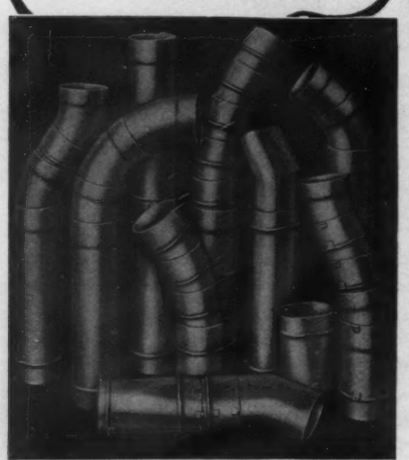
■ ■

1940 Roper Range

Geo. D. Roper Corp., Rockford, Ill.

Description: The 1940 model of the Roper gas range features a staggered burner top arrangement in addition to the "Peasant-Ware" grill. This feature consists of an enameled pan and a grill made of pottery, both of which rest in an E-Z Roll drawer broiler. A chrome plated serving tray is also provided in which to place the pan and grill when taken from the broiler.

ELIMINATE CONDENSATION TROUBLE



VITROLINER
—the permanent chimney lining that totally eliminates chimney deterioration caused by acid-bearing moisture deposited by all types of fuel. Made of Armco Ingot Iron, vitreous enameled both inside and out.
Also manufacturers of Condensation Eliminator and Howle Heat Extractor. Write for free condensation folder and price list.

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2515 Archer Avenue - - Chicago, Illinois

Power Commission Makes Amendments To Rate Change Regulations

EFFECTIVE February 1, 1940, natural gas companies are now required to file with the Federal Power Commission additional data regarding proposed changes in rates and charges, it was announced recently by the Commission, following the adoption of amendments to former regulations governing rates and charges.

Under the amendments, natural gas companies making rate changes will be required to submit, among other things, the following information:

(1) A statement of the reasons for the proposed change and, if an increase in rate or charge, a justification thereof.

(2) A comparative statement of sales and revenues, by months, under the present and the proposed rates, for the twelve months immediately preceding and for the twelve months immediately succeeding the proposed effective date of the change in rates.

(3) A comparison of the proposed rate with other rates of the company for similar service in the same territory.

■ ■

Minnesota Valley Co. Distributes Gas Piped Through 240-Mile Line

The Minnesota Valley Natural Gas Co., a natural gas distributing company with headquarters in St. Peter, Minn., has recently secured a franchise in Shakopee, Minn., where it is expected a local distribution system will be installed early in the spring. A. W. Scofield, new business manager who represents the company in securing franchises, estimates Shakopee will have about 400 meters.

Natural gas was recently brought to Chaska, Minn., where the Minnesota Valley company serves about 400 meters. All gas is purchased by the company from the Northern Natural Gas Co., Omaha, owners and builders of the new 240-mile gas line from Sioux City, Iowa, to Minneapolis, Minn.

The Minnesota Valley Natural Gas Co. now serves Mankato, St. Peter, LeSueur, New Prague, Montgomery, LeCenter, Cleveland, and Chaska. R. E. Crawford, Minneapolis, is president.

■ ■

Cooperative Advertising Program for 1940 Scheduled by P. C. G.A.

A budget of $40,300 has been approved by the Pacific Coast Gas Association for 1940 cooperative advertising, as against $39,800 expended in 1939, it has been announced by A. E. Holloway, president of the Association. A committee composed of J. S. Spaulding, advertising manager of Southern California Gas Co., Los Angeles, and A. C. Joy, advertising manager, Pacific Gas and Electric Co., San Francisco, has selected seven domestic magazines, four publications for architects and builders, two appliance retail magazines, four commercial cooking, and one industrial and commercial publication in which the advertisements will appear in 1940.

■ ■

Southern California Gas Co. Remodels Beverly Hills Office Building

The contract has been let and work will start at once on the modernization of the Southern California Gas Co. office building in Beverly Hills, Calif., according to E. F. Aigner, local manager. The cost of the project will amount to approximately $17,000, and the work will be done by R. E. Frankenberger, Los Angeles contractor.

The exterior front of the building will receive modern architectural treatment with the use of colored ceramic veneer and the installation of large display windows. Special features for the interior will include a terrazzo floor, modern indirect lighting, and forced air gas heating and ventilating.

■ ■

Illinois Utility Issues Educational Folders With House Organ

For the education of company employes, the Central Illinois Light Co., Peoria, Ill., has recently distributed with its house organ, the Cilco News, two pamphlets on subjects of general interest. The first insert was a diagram and explanation of the construction of its East Peoria station, and the second was a diagram of the Government of the United States, showing and explaining in full the three branches of government.

■ ■

New 24-Mile Kansas Line Planned

A new 24-mile pipe line to Atchison, Kan., from a 1426 ft. gas well six miles northeast of Oskaloosa, Kan., has been proposed recently. The well, which produces between eight and 10 million cu. ft. of gas per day, is owned by a group of men headed by D. W. McLaughlin of Des Moines, Iowa.

BUNDY TUBING

(COPPER COATED STEEL)

Offers Many Advantages in Gas Appliance Manufacture

Bundy Tubing combines the strength of steel with workable ductility and for many applications offers worthwhile economies.

Available in sizes from ⅛" to ⅝" O. D. either in lengths or completely fabricated. Write or wire for complete information.

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GASAIR MIXERS AND VAPORIZERS

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Manager

Educational Food Program Planned For Students in 21,000 of the Nation's High Schools

AN EDUCATIONAL foods program-contest related to gas refrigeration is being launched this month for home economics students in 21,000 urban high schools throughout the nation, it has been announced by Jane Tiffany Wagner, director of the home economics department of Servel, Inc., New York City, who has worked out the details of the program in cooperation with Eleanor Howe, of Harvey and Howe, Inc., Chicago, Ill., publishers of the two magazines through whose pages the program will be projected. The magazines are *The Student Home Economist*, a monthly publication devoted to the educational interests of high school home economics students, and *What's New in Home Economics*, a monthly educational and news magazine. The project is expected to reach two and one-quarter million students in city schools.

The objective of this educational program is to give the nation's thousands of city home economics students an opportunity to acquire skill in home projects and to learn about modern methods of food preparation and preservation. Field trips by home economics classes to gas utility companies are to be arranged, for special studies of gas refrigeration. Wherever possible, special demonstrations are to be given for the students and their teachers by the home service departments of gas utilities.

Students must submit their contest entries to their teachers by May 1, 1940, and teachers must submit their entries to *The Student Home Economist* by May 10, 1940. The national student winner and her teacher will receive a major prize of a trip to Washington, D. C., for a week with all expenses paid. In addition, the teacher is to receive for her school laboratory a new Servel Electrolux gas refrigerator. Each state student winner is to receive $25 and an insignia bar pin, and the teacher of each state student winner may choose for her school laboratory either a check for $25 to be used on the purchase of any piece of laboratory equipment she wishes, other than a refrigerator, or a certificate of credit for $50 to apply on the purchase of a Servel Electrolux gas refrigerator. Each school winner will receive an insignia bar pin.

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Standard Gas & Electric Announces 1940 Budgets

Public utility operating companies in the Standard Gas and Electric Co. system have a tentative construction budget for 1940 amounting to $37,047,735, according to a statement by Bernard W. Lynch, president of Standard Gas and Electric Co., Chicago, Ill.

This amount includes $5,365,152, which was carried over from the 1939 construction budget for expenditures on projects not completed in 1939. Of the total amount budgeted for 1940, $3,454,021 is allotted to the gas department.

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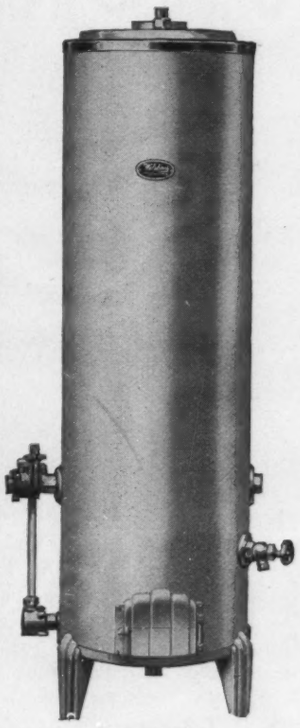
Seminole Co. Sells Systems

The Seminole County Gas and Oil Co., of Seminole, Okla., has sold to the Oklahoma Natural Gas Co. the gas distribution systems at Konawa, Asher and Sacred Heart, Okla., according to George Killingsworth, owner of the Seminole company.

"Toppers Again by Roper in 1940" was the theme of the Geo. D. Roper Corp. sales convention in Rockford, Ill., January 3-4. Representatives from all over the United States and Canada attended the meeting, at which the complete line of 1940 Roper ranges was presented.



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*Or California

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Pennsylvania's Industries Report 1939 Expansion

New plants and equipment costing $194,846,109 were started or scheduled by Pennsylvania manufacturing and utility companies in 1939, it has been reported by Richard P. Brown, Pennsylvania's secretary of commerce. The figure is more than twice as large as the total of new capital investment in this state's industry in any recent year, and exceeds the figure for any other state in the Union for 1939, Mr. Brown states.

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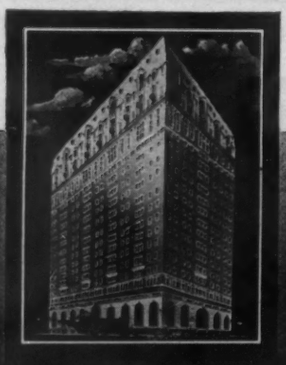

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A. G. A. Plans Industrial Sales Meeting

THE much-discussed subject of industrial drying and baking by means of the near infra-red ray heating process will be one of the highlights of the A. G. A. Conference on Industrial Gas Sales, to be held in the Commodore Perry Hotel, Toledo, Ohio, March 28 and 29.

Since the development of the new method of firing finishes by means of heating rays, instead of circulating heated air, it has been seized upon by manufacturers of electrical equipment as a possible means to capture the industrial drying and baking load now held by gas. The conference will not only examine the validity of the claims that are made for the process, but will also discuss such investigation as has been completed on the feasibility of utilizing gas in the same manner. The discussion will be led by Hale A. Clark, Michigan Consolidated Gas Co.

In the course of one of the meetings, Ralph Towne, of the Surface Combustion Co., will conduct an "Information Please" session, in which a group of experts of his own selection will be confronted with questions asked by members of the audience. Mr. Towne has assured Eugene D. Milener, secretary of the Industrial Gas Section of the A. G. A., that his program will be unrehearsed and his experts will not be forewarned of the questions that will be asked them.

The personnel of the Committee on Program and Papers consists of: Ralph S. Wenner, chairman, The Ohio Fuel Gas Co., Toledo, Ohio; Hale A. Clark, Michigan Consolidated Gas Co., Detroit, Mich.; Homer T. Wood, Battle Creek Gas Co., Battle Creek, Mich.; Merle Martin, Public Service Co. of Indiana, Indianapolis, Ind.; Franklin T. Rainey, *ex officio*, The Ohio Fuel Gas Co., Columbus, Ohio; A. M. Thurston, The East Ohio Gas Co., Cleveland, Ohio; Ralph Towne, Surface Combustion Corp., Toledo, Ohio; Eugene D. Milener, secretary, A. G. A., New York, N. Y.

Gas Service Co. Reports Greater Domestic Load

The Gas Service Co., Kansas City, Mo., has reported that in 1939 an all-time high was reached in domestic gas sales, while a decrease was shown in total gross appliance sales and installations. The number of domestic customers increased 5585, or 2.2%, last year over the total for 1938. Gross appliance sales and installations totaled $2,406,986, a decrease of 3% under the preceding year. However, the actual value of new appliances placed on the lines during 1939 amounted to an increase of 11.9% over 1938 because a large amount of equipment on rental was sold the previous year and included in last year's sales figures. Industrial consumers increased 6.3% in 1939 over 1938.

West Virginia Commission Grants Clayco Petition

The Public Utilities Commission of West Virginia has recently granted the Clayco Gas Co. authority to acquire from an affiliated corporation natural gas, casinghead gas and oil production properties, operated and unoperated acreage, fee simple and leasehold estates, wells and equipment, pipe lines, easements, compressor stations, certain gasoline plants, contracts for the purchase and sale of gas, and in exchange therefor to issue common stock.

Citizens Utility Reports Record Gains in 1939

Gains in all brackets of gas consumption were reported recently by officials of the Citizens Gas and Coke Utility, Indianapolis, Ind. More than 3547 gas consumers were added in 1939, bringing the total to 88,901, while the total amount of gas sold increased 328,000,000 cu. ft. over 1938, making the total amount sold in 1939 a little over 3,925,784,200 cu. ft. Record breaking gains were also reported in house heating consumption, which increased 116,000,000 cu. ft.; in industrial consumption, which showed an increase of 178,000,000 cu. ft., and in commercial consumption, which increased 29,000,000 cu. ft. over 1938.

Natural Gas Production Increases in Oklahoma

Production and value of natural gas in Oklahoma during 1939 showed an increase over 1938, according to a compilation by the *Daily Oklahoman*.

Natural gas production was estimated at 338,000 million cu. ft. for 1939, an increase of 8000 million cu. ft. over 1938. Value of the gas at the well was $7,300,000 and to the consumers $32,970,000. Value of natural gas at the well was $40,000 higher than in 1938.

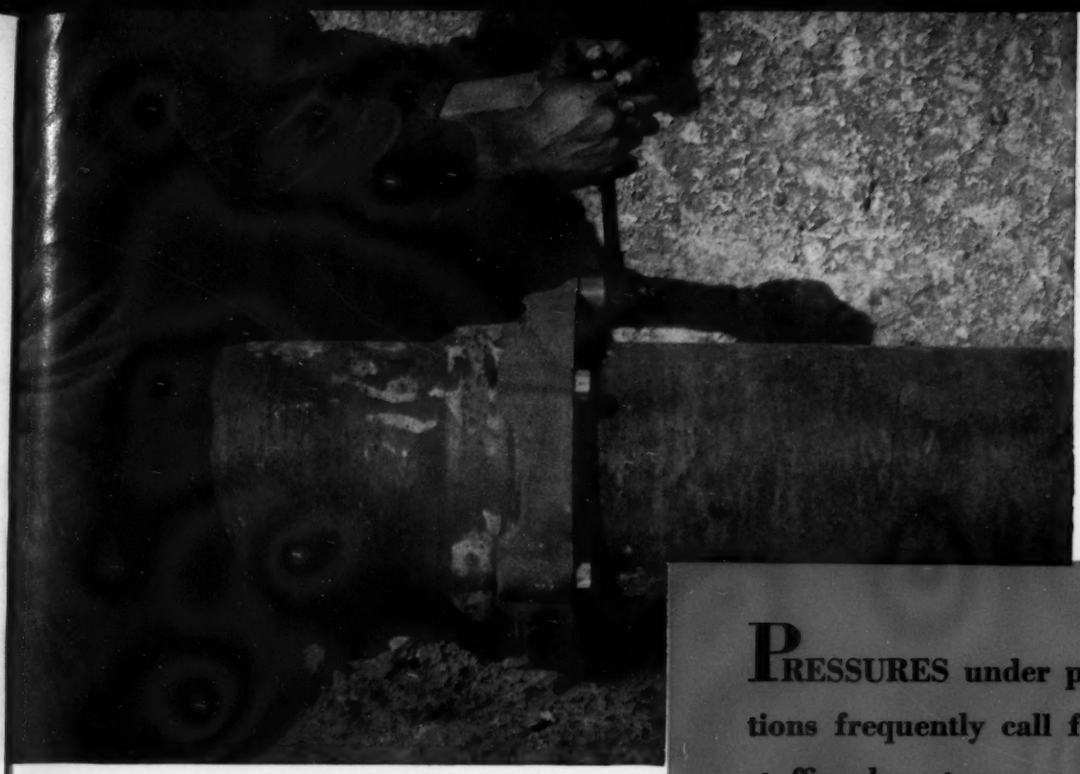
Production of natural gasoline increased nearly 2,000,000 gals. for 1939, to an estimated 470,100,000 gals.

Appliance Sales Hit High Mark for Brooklyn Union

An all-time high mark was reached in 1939 in appliance sales by the Brooklyn Union Gas Co. The total for delivered sales was $3,920,767.56, which was a gain of more than a quarter million dollars over the former record, established in 1937.

L. N. Steele Passes Away

L. N. Steele died Dec. 7 at Fort Smith, Ark., as a result of burns sustained in an explosion two days earlier. He was chief engineer for the Arkansas-Oklahoma Gas Co. and 53 years of age.



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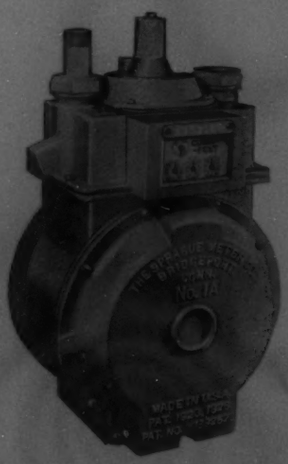

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